

OCTOBER

25c

**THE MINIATURE CAMERA
MONTHLY**

Volume One

**TRAPPING MINIATURE
MONSTERS**

By ROBERT C. McRAY

**SECRETS OF
PHOTOGRAPHIC MAKE-UP**

By GEORGE A. BOWELL

**ACTION SHOTS WITH
LOW PRICED CAMERAS**

By H. CROWELL PEPPER

SPECIALIZATION PAYS

By TERRY WAGNER

**ILLUSTRATING YOUR
FAVORITE BOOK**

By EVELYN BAIRD

**HOW TO TAKE FOOTBALL
PICTURES**

By JAMES H. BELL

**THE CANDID CAMERAMAN
ROAMS AT NIGHT**

By KARL A. BARLVEEN

THE CAMERA DETECTIVE

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A miniature camera, price \$12.50 or cheap at \$300, is a passport to high adventure on which there is no closed season. Listen in on the conversation when two or more minifans foregather. Miniature photography is that truest of all democracies where rank is determined by achievement. If living is the enjoyment of life, and zest comes from doing something different, then the minicam fan lives several lifetimes in one.

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C O N T E N T S

Vol. 1

OCTOBER, 1937

No. 2

COVER

Very Candid Camera.....by Dudley Lee

COLOR PLATES

Study In Light.....	by Dudley Lee.....	35
Miniature Monsters	by Herbert C. McKay, F.R.P.S.....	36
Dancers	Chromatone Print.....	69
Sleeping Beauty	by Evelyn Baird.....	70

ARTICLES

What, No Birdie?.....	3	How to Take Football Pictures.....	41
The Candid Cameraman Roams at Night.....	7	By James H. Bell	
By Karl A. Barleben, Jr., F.R.P.S.		Stay-at-Home Photography.....	46
The Secrets of Photographic Make-up.....	13	By Jacob Deschin	
By George A. Bohnell		The Camera Detective.....	50
Speed Photography with Low Priced Cameras..	18	Specialization Pays.....	56
By H. Crowell Pepper		Wagner-Connor	
Heyworth Campbell, America's Foremost		Dodging Ins and Outs.....	61
Art Director.....	25	A Filing System for Miniature Negatives.....	63
By Frank Hunter		Paper Prints from Natural Color Film.....	65
Photographing the Invisible.....	28	By Rowland S. Potter	
By Augustus Wolfman		How to Illustrate Your Favorite Book.....	71
Build It Yourself.....	33	By Evelyn Baird	
Trapping Miniature Monsters.....	37	How to Make Photo Murals and Decorations..	76
By Herbert C. McKay, F.R.P.S.		MINICAM's Prize Contest.....	79

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The CANDID CAMERAMAN

Roams at Night

By Karl A. Barleben, Jr.

F. R. P. S.

Have you done any outdoor night photography? You don't need expensive cameras or high speed lenses to shoot candid pix around the clock. In this unusual article the candid camera editor tells how it is done, including a valuable table of night exposures for all conditions.

TEN years ago if you saw a cameraman prowling by night it was a sure sign the poor fellow had sniffed one dose of hypo too many.

The modern candid camera changed all that. When the last ray of daylight fades and skyscraper windows start winking like so many newly-opened eyes, when a thousand neon signs throw their glare up into the sky and street lights cast mysterious shadows—that is the time to start thinking of pictures that are literally different from “anything

under the sun”.

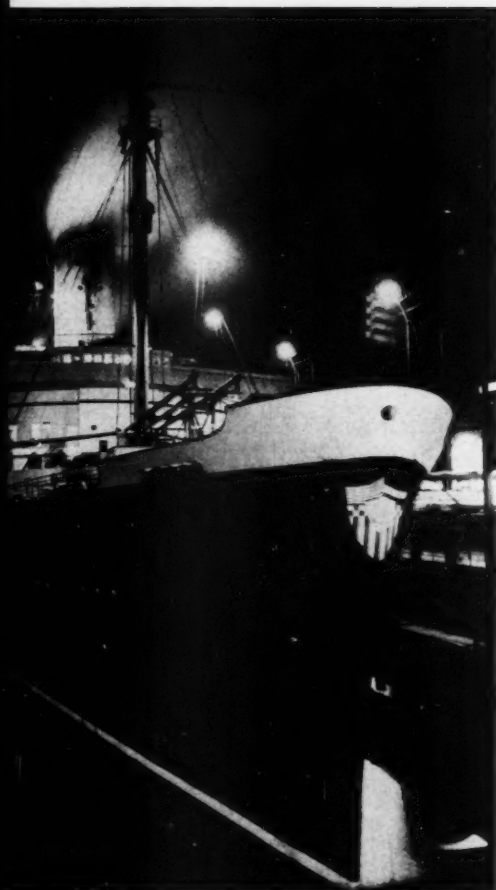
There is something about setting up your camera in a sheltered spot and pointing it at the specks of light shining out of the distance that cannot quite be equaled by any other

Giant neon and tungsten signs sweeping across the field of view offer workable material for the nocturnal nomad. Exposure: 1/10 second at f:3.5.

← LIGHTNING

By Dr. K. Winfield Ney
An extraordinary picture of lightning over New York's Empire State Building. Exposure: 1:1.9, shutter left open for duration of the flash.

"Uptown—it's
ALEXANDER'S"
NEW YORK CO.



A full head of steam! An unusual and dramatic shot of an ocean liner ready to cast off.

Courtesy Eastman Kodak Co.

sort of experience. And in the finished picture, too, there is a quality of beauty and mystery that the best daytime shot cannot even approximate. Nocturnal nomads . . . that's what modern candid snappers are.

If you refrained from night shooting because you didn't own one of the "cat's-eye" lenses, you can forget your fears. You can get first rate results with an inexpensive $f/4.5$ or $f/6.3$ lens almost as easily as with a Contax or Leica "One-five". Night photography gives such a tremendous sweep of subject matter, changes ordinary surroundings into such completely different vistas, that your problem is what to discard rather than what to select.

To come to cases, what have we? First, of course, the theatrical section, with its elaborate signs, gay marquees, brilliantly illuminated show-windows — whether on Times Square, Randolph Street or Main Street. Stroll through the district after dark with your camera and keep a watch for the nocturnal nomads, just like yourself, out for the unusual and the exotic in the way of a picture. Survey the scene as your lens might and you will see material for miles of film.

Go again on a foggy night or right after a rain-storm when the pavement glistens with reflected light. Here are countless varieties of rich pictorial material. You can take snaps at as slow a speed as you dare hold in your hand or propped against a convenient doorway or lamp post. Or you can set up your tripod in an inconspicuous spot. Either way, you'll learn that people in general are decent about not bothering you.

If you can harden yourself to withstand a bit of naive gaping, you can achieve tricky effects with time exposures in the streets, despite traffic whizzing back and forth. The secret is to stop the lens down and make the exposure long enough so that moving objects, cars and people strolling before the lens, do not register on the sensitive emulsion. If you haven't that much patience, you can shield the film merely by holding your hand before the lens when something passes.

On the other hand, some motion in the scene will give an effect peculiarly its own and at times very desirable, especially when shooting a lonely road. If a car passes you will get two parallel streaks of light extending the length of the road as the headlights pierce the gloom. Try it sometime.

FIREWORKS displays and lightning are two dramatic sources of pictures that pack a wallop and are simple to get, once you know how. In both cases a tripod or some firm support is essential. Simply set up the camera facing the direction you expect the next burst or flash, open the shutter on "Time" and let events take their course. For fireworks, panchromatic film is advisable because the displays are many-hued and an ortho emulsion would miss most of the effects, particularly the reds which predominate. Ortho film will do nicely with lightning

which is generally blue light and pretty intensive. In both cases, naturally, you will focus your lens at infinity.

On lightning, of course, you have to take your chances. With fireworks, however, if you familiarize yourself with the general type of display you can often calculate the burst so nicely that a "snap" exposure will catch one at the peak of its spray. Again, you can leave the lens open and fill your picture with a dazzling array that will knock you dizzy with admiration when you print it. For both fireworks and lightning "Time" exposure, $f/8$ to $f/11$ is amply fast. In either case, if you leave the lens open for any length of time, guard against incidental light such as illuminated building windows, signs, etc., included in the field of the lens' vision. Such precaution goes a long way.

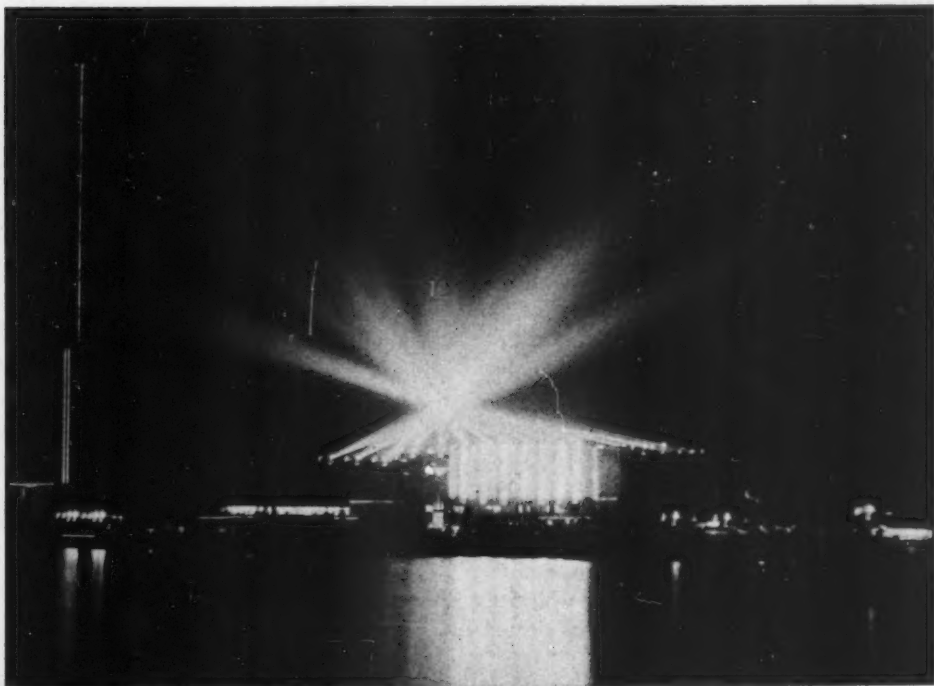
It's a good idea to stick for a while to safe time exposure. If, however, you simply have to experiment—and I know how you feel—you can try instantaneous fireworks shots at peak around one-fifth to one second at $f/4.5$ or $f/3.5$. If your film is extra-fast you may

get by at $1/25$ th or faster, depending on how brilliant a burst you get. Err on the safe side since there's no particular virtue in shooting fast unless your tripod is resting at home on the shelf.

After the blazing action of lightning and fireworks, moonlight pictures may seem like tepid brew, but don't fool yourself. Patience will result in shots that will astonish even yourself. I'm not referring to faked moonlight pictures, an art in themselves, and which we'll consider another time, but genuine shots under fourteen carat moonlight. Pick a night when there's little or no haze in the atmosphere. The season of year we're just coming into—fall—is best suited for these shots. Try for a full moon and a night when it is properly positioned in the skies to do the most good from a standpoint of illumination.

Don't make the mistake of including the moon in your picture unless you are working with fast or hypersensitized film and can take a fairly short exposure. Why? Because the earth rotates and thus causes the moon to remain in one spot only a fraction of a second.

Shafts of light stabbing the darkness offer interesting patterns, particularly if a body of smooth water is in the foreground to reflect the scene. Exposure: 1/10 second at $f:2$.



Fiddle with prolonged exposures and your moon will show up as an unromantic sausage.

The open country is best for moonlight work since city buildings, to say nothing about traffic, offer conditions which are unfavorable to utilizing the illumination. For one thing, the artificial lights interfere and rob the moonlight of its force. Again, the shadowy areas caused by the structures leave unsightly black masses in the picture. Not that architectural subjects do not make good material. On the contrary, they are remarkably attractive subjects when flooded with moonlight. But try to pick a single building off by itself in the open, a museum, a school or a rural home. Often an artificial pond, a swimming pool or even a lake front will offer reflections of the structure, doubling the value of the scene.

You can go completely wild in exposures under moonlight, and there is hardly a limit. A bright, round moon, a lack of aerial haze and a subject in the open may be successfully recorded on a speedy film at $f/2$ in three or four minutes. (Of course, you must use a tripod on all moonlight shots.) By the same token, $f/11$ or $f/16$ may be used by increasing the exposure proportionately. At these stops, the same conditions would require in the neighborhood of 160 minutes for $f/11$ and 320 minutes for $f/16$. From these figures you will understand how essential it is that the scene include nothing that moves, not even the branches of trees. If snow is on the ground, you can safely halve these exposures, because the snow reflects a considerable amount of light back onto the scene. If these seemingly long exposures irk you, take pipe and a pouch of tobacco, or an agreeable companion with you, for it's going to be lonesome at midnight . . . and perhaps cold, too. But after your first picture you will agree that the results have justified your troubles.

There are virtually countless night subjects worth photographing, regardless of whether you are in a metropolis or in a tiny village. The material is limited only by your own imagination, skill and patience. Just because it is raining, don't stay home . . . some of the most beautiful effects can be made while it is raining or shortly after the storm has cleared.

Or again, in the big city, you might try climbing to the roof of a skyscraper and shooting a panorama of the city as it lies before you like a giant, diamond-studded carpet of black velvet. I can assure you that every moment spent in creative nocturnal camera roving will bring new pleasures and new adventures in photography.

WE come now to the problem of exposure. Obviously the photo-electric type of exposure meter isn't going to be of any help since it won't even give you a reading in most instances. The visible-extinction type may be of some aid in the shorter exposures, but when you are working in terms of anywhere from half a minute to half an hour, you are pretty much on your own. In general, it is a safe idea to give it a good deal more rather than a bit less. When your exposure is ten or fifteen minutes, another minute or two won't do it any harm and you can always compensate for it in the printing provided you have not overdone it by too much.

A good stunt if you don't begrudge using a few extra frames of film, is to take a guess at your exposure and then shoot three pictures, one at the estimated speed, another at half that speed, and a third at double, keeping the lens aperture constant. Nine times out of ten you'll have at least one printable negative. Don't fail to make a note of each exposure, lens aperture and shutter speed, for future reference. That's the only way to learn.

Working out the correct exposure for night photography is part of the fun, but to give you a starting point I offer the following table. Accept it with a degree of caution. Your exposure must be predicated on the amount of light available and it follows that this will be subject to a good deal of variation. In compiling my table, I have tried to take minimum rather than maximum speeds. Also, I have presumed the use of super-sensitive film in all cases.

Glow Over Fifth Avenue

By Edward Alenius, F. R. P. S.

A splendid example of night photography which captures not only the effect of night but the atmosphere as well. Exposure: 3 minutes at $f:4.5$.



SUBJECT	f1.5	f3.5	f4.5	f8	f11
General street scenes with many illuminated signs, shop windows, etc.....	1/50	1/25	1/10	1/2	1 sec.
Close-ups of Mazda and neon signs, shop windows and theatre fronts.....	1/50	1/25	1/10	1/2	1 sec.
Theatre fronts under marquees for good exposure of details of passers-by.....	1/50	1/25	1/10	1/2	1 sec.
Average street scenes without special illumination, clear weather.....	1/25	1/10	1/5	1 sec.	2 sec.
Rather dark street scenes with only single street-lamp	1/10	1/5	1 sec.	2 sec.	4 sec.
Street scene in fog, rain or snow.....	1/5	1/2	1 sec.	2 sec.	4 sec.
Buildings floodlighted by spots and beams.....	1 sec.	2 sec.	4 sec.	8 sec.	16 sec.
Moonlight scene, full moon, clear night.....	2 m.	4 m.	8 m.	20 m.	1 hr.

ALWAYS use your lens shade for night pictures. It will prevent the many point-sources of artificial light, such as Mazda and neon signs, street and automobile lamps from striking the lens and causing all sorts of disfiguring marks on the negative.

There is little to worry about in processing so long as you are careful about those fine-grain developers that lose speed. A high-energy developer that will get the maximum from the feeble light action on the emulsion is your safest bet or, if you want to avoid undue grain, a good prepared developer that

strikes a fair average between speed and grain size.

When you inspect your first developed night negatives you may be inclined to feel disappointed and doubt that good prints can be made from them, they'll appear so thin compared with daylight negatives. But as you go on, you'll become accustomed to this thinness, especially when you learn to "read" and interpret them. Usually, a "hard" or contrasty paper will make up for much that the negative lacks. Don't forget, too, that in printing you will want rich blacks, otherwise

the print will look anemic. You won't get much detail in night scenes, unless you expose unduly, so don't expect it in the prints. (When you do get it, you'll be accused of having faked your shot!) As I mentioned earlier, this is an ideal time of the year to test your skill, for the atmosphere is clear and bright, and it is still not too cold for comfort, even quite late. Try a few "nocturnals" of your own.

*Nocturnal by Disraeli
Exposure: 1/200th of a
second at f:3.5. Courtesy
U. S. Camera.*



Fig. 1.
*Old age made up as
described in these pages.*



The Secrets of **PHOTOGRAPHIC MAKE-UP**

By George A. Bohnell

The accompanying pictures are all of the same girl



PHOTOGRAPHIC make-up serves two wholly contrary purposes.

First, make-up can produce radical alterations in character. Here the photographer is not particularly concerned with how his model actually looks except as a problem to be overcome. He uses make-up to yield a face of his own creation. He turns youth into age by the addition of a few skilfully placed wrinkles, completely changes features through the medium of putty and, in general, tries to prove that "things are not what they seem."

Radical facial alteration is a pleasant and often hilarious game, but for the average amateur it is little more. The truth of the matter is that the part played by the actual make-up pencil is only sec-

Fig. 2.
*This is Pat as she looks
to her school mates.*



Fig. 3.

A heavy "movie" makeup affected by young girls who are screen-struck. Such a makeup would cause a sensation in Hollywood, but is not uncommon in high-schools. The straight cheek line and bushy side hair give the appearance of a heavy, bony face.

ondary to the model's ability at mimicry. Penciled wrinkles, crepe hair and a liberal dose of putty will give a superficial semblance of age, for example, but even more must the model be able to assume the mental and physical attitude of weighted years — by no means an easy task. The finished picture, even if excellent, is interesting chiefly as an occasional trick.

LESS exciting, but of infinitely greater value is the second purpose of photographic make-up. Briefly stated, its function is as a substitute for the retouching pencil and the etching knife.

You've seen professional portraits and envied them their smooth perfection of skin quality, the absence of distracting bumps and blemishes, then looked with despair at your own efforts. The answer, of course, lies in retouching. The difference between you and the professional photographer is that

while you make your pictures like the originals, the professional makes them like the originals imagine themselves.

Retouching is a difficult business, so delicate in fact, that even most professionals send their work to specialists in that craft. The amateur, and particularly the miniature camera worker, had best leave retouching severely alone. Here the value of make-up becomes evident, for with only very little effort and a slight knowledge of make-up technique any amateur can turn out excellent miniature camera portraits needing no retouching.

You can make slight and subtle changes in facial contours without losing photographic likeness. You can make a face rounder, fuller, thinner, you can add to or subtract from the length of a nose. You can add five years to a naive youngster and make her look the woman of the world she fondly imagines herself, or you can flatteringly remove five years from your more adult sitter and restore that bloom of youth whose fading she refuses to admit.

Human skin is not of even tone. The

Fig. 4.

Hair loosely combed, a bit of putty and an old bathrobe are the only props necessary to create this slattern.



most perfect complexions possess blotches and spots which the camera searches out relentlessly. Lines which will make their appearance years from now belong to the present in the view of the pitiless lens. These are the defects the retoucher erases with skilled touches of knife and pencil and which you can remove as well or better with paint and powder.

The materials and implements of retouching are shown in Fig. 9. Both Max Factor and Stein make a line of photographic make-up (as opposed to stage) known as "Panchromatic". These are paints intended to give correct skin tones when photographed with panchromatic film. Paints are



Fig.

Cold cream and ground color have been applied, but not yet blended. Lips and eyes have not yet been touched.



available in light and dark shades. While ordinarily the light is for women and the dark for men, you will find that a sunburned or quite dark girl takes the heavier shade better than the light.

The general procedure is the same for all types of make-up. After the face has been carefully washed, it is greased heavily with cold cream. Next the ground color is applied. This is grease paint in one of the two tones. Now come the accents, lines drawn in for various types of effects as will be presently described. Following this the face is heavily powdered and, finally, the eyes, eyebrows and lips are treated with mascara and rouge.

Fig. 5.

With her brother's good white shirt over her dress, and a towel on her head, Pat is ready for the first application of cold cream.

None of this sounds hard and, as a matter of fact, there is nothing particularly difficult or secret about successful make-up for general photography. The basic principles are few. Once you have mastered them (and a few rehearsals on your favorite girl friend will turn the trick), you will presently evolve variations and effects wholly your own.

The preliminary application of cold cream must be thorough. Massage it into



Fig. 7—Above.

The effect of the heavy neck and full face is achieved by a few skillful touches of shadow and pencil line.

Fig. 8—Left.

Pat as a siren. Note the great difference in facial width between this picture and Fig. 7, above.

Fig. 9—Below.

The total equipment for photographic retouching is shown here. As described in the text the entire outfit can be purchased for less than five dollars.



the face, neck, under the chin and behind the ears for several minutes. Wipe it off with facial tissues until no more grease leaves the face freely. The skin now feels soft and pliable and slightly greasy.

The trick in applying the grease paint, or ground coat, is to obtain a good even coating without spots or streaks. Daub a few spots on the face and blend it in with liberal massage. Be sure the color reaches up to the hair roots and spreads

over the neck and ears.

Now come the accents. For "straight" make-up these are limited to eye shadow and eye lines. The shadow is put on just as it would be for street or evening wear except that the brownish panchromatic shadow cream is used. The application is moderately heavy. Next the eyes are lined with the eyebrow pencil, sharpened to a point. For straight work, keep the lines light.

The procedure is as follows: On the lower lid, start at a point about one-third the distance from the inner corner of the eye and continue the line outward to the outside



Fig. 10.
Cheeks lightly shaded. Eye corners drooped. Hair parted on the side go to make up this change.

corner. The upper lid is lined throughout its entire length and a quarter of an inch beyond, outward. The lines must be placed right along the edge of the lid, against the roots of the lashes.

Right here you can introduce a subtle modification. The direction of the outer end of the line on the upper lid has much to do with expression. An uptilted line makes the

eyes look oblique and provocative while a downward tilt gives the effect of broadening them and results in a more placid expression.

When the lines have been applied, go over them lightly with a small camel's hair brush. This blends the edges and removes much of the artificiality. Now powder the face *heavily*. The powder on the puff is piled on until the face appears submerged. Then delicately dust off the loose powder with a face brush, making sure that your subject's clothing is protected by an apron or smock.

At this point the face should have a velvety, dry appearance, the artificial appearance of the lines being largely gone. However, the eyes will appear lost and the face dull. Mascara to the rescue!

First the brows are carefully darkened with the mascara and lengthened, if necessary, with the pencil. The eyelashes should be heavily mascaraed, care being taken not to smear the color on the lids. Finally the lips are rouged, using brown panchromatic rouge, the hair is dressed — and the subject is ready for the camera.

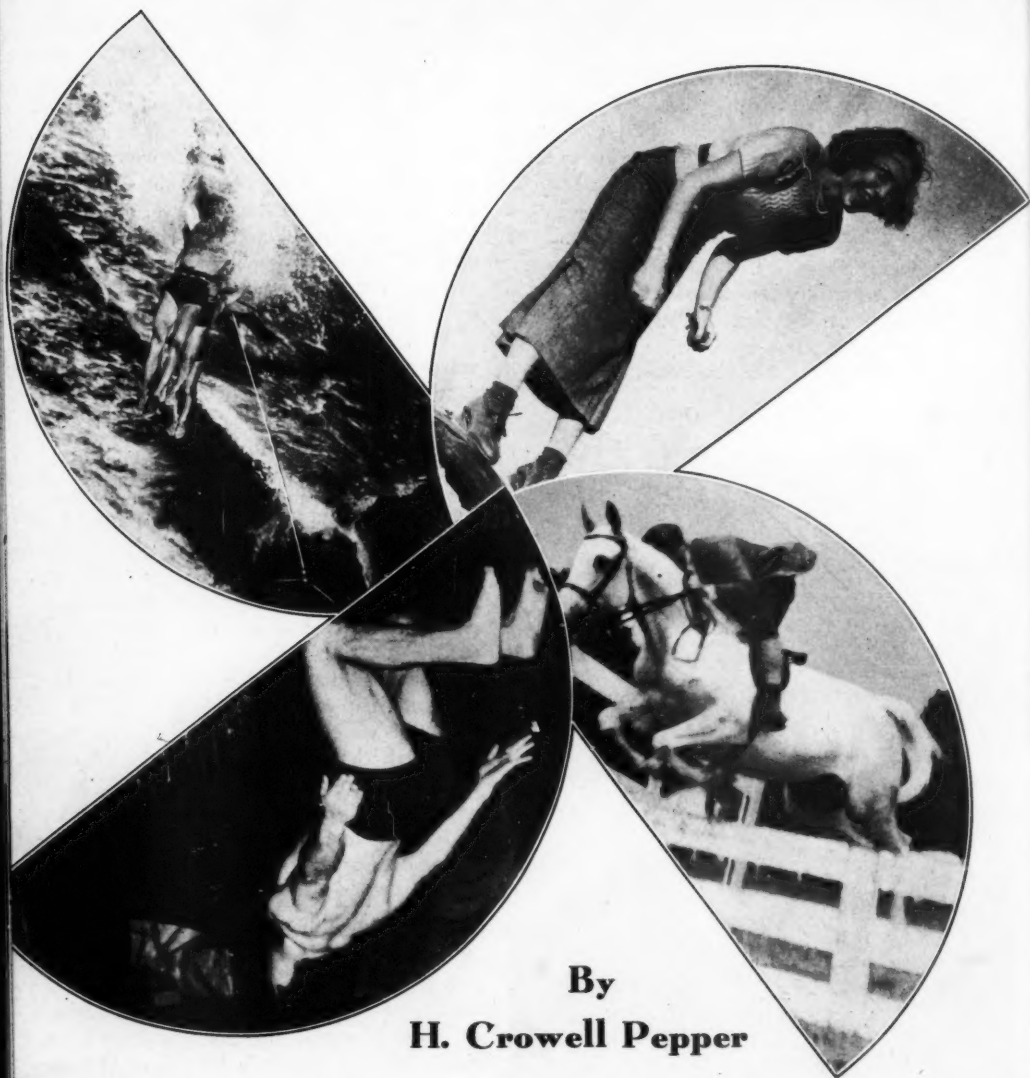
Be careful to examine your subject in a brilliant light for possible false spots. If the face appears chalky, too much grease paint was used. Make certain that the color extends over the neck and gradually fades off without leaving a line. Practice this general make-up a few times with some willing victim and examine your test exposures.

The Permutations of Pat

PAT is an amiable young lady, average pretty and possessed of a round, rather full face — the exact word is chubby. Also she is patient and long-suffering. Incidentally, there is a good tip for you here. Practically no girl can resist the allure of make-up. Merely hint that you intend to do an elaborate job of facial decoration and you will never lack for models.

However, back to Pat. Our specific problem is to make her look sophisticated, which normally she most certainly does not, and at the same time to narrow her face to a somewhat more exotic outline. We must bear in mind that in a photograph a face is made up of varying tones which represent depths of shadow in the original. Therefore, if we want to accent a shadow, we use gray

(Page 85, please)



By
H. Crowell Pepper

SPEED PHOTOGRAPHY

With Low Priced Cameras

THERE is something peculiarly American in our fascination of snapping moving objects. It requires the power to think, see and act quickly. Since most of us own cameras equipped with $f/4.5$ or slower lenses and shutters that seldom have speeds greater than $1/300$ th of a second, what are our chances of success in arresting action?

As in all photographic work, there are certain factors involved in shooting moving objects. Before we consider these, let me say that it is practically impossible to stop motion. All we can do is secure an image in which motion *seems* stopped.

The human eye accepts displacements of $1/100$ th of an inch as sharp. But if we intend to enlarge a picture, the displacement must be such that in the final print itself not more than $1/100$ th displacement is evident. For example, if we want to show no motion in a five times enlargement of a racing automobile, the actual motion in the original negative may not be greater than $1/500$ th of an inch.

In modern photography the tendency is against trying to stop objects dead. The effect of this "freezing" is the absence of any sense of motion and the object photographed might just as well have been standing still. *What we really want is a sharp image with the distinct feeling of its motion.* This is obtained by either slowing the shutter speed or by "panning" with the motion of the subject.

Here are the points to know in taking action pictures:

1. *The speed of the moving object.* The faster the object moves, the greater the displacement upon the film and the shorter must be the exposure.

2. *The distance of the object from the lens.* The nearer to the lens, the shorter must be the exposure, because the object on the film is larger and the displacement consequently greater.

3. *The focal length of the lens.* The greater the focal length of the lens, the larger the object will be upon the film and the greater the displacement. Longer focal length lenses require shorter exposures.

There are certain modifying factors which tell us to reckon our exposures. In my judgment, the most important, is that of direction of movement. When an object passes at right angles across the lens we receive the full effect of its actual speed and must use a high shutter speed. If the object is approaching "head-on", or receding, there is no lateral displacement and to all intents we need not worry about the high shutter speed. Between

these extremes we have a series of angles in which the lateral displacement varies considerably and we may lengthen our exposure with the change in angle as we approach the "head-on" direction of object approach.

May I direct the attention of those who do not know that shutter speed

Not all cameras are equipped with ultra-fast lenses or shutters capable of working at $1/1000$ th of a second. In this article specifically addressed to owners of medium and low priced cameras, Mr. Pepper shows how dynamic action pictures can be made that will rival the best efforts of the most expensive equipment.

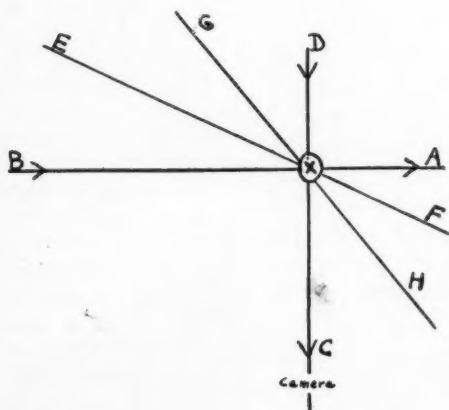


GLEN GRAY

By Richard Lorbach

Taken at a point about three feet from the floor, this picture shows what can be caught at a moderate speed. The exposure given was $1/75$ at about $f:6.3$ on Panatomic film. The light source was a No. 20 Photoflash bulb in a Kalart Junior synchronizer. The baton was going 49 feet a second while Glen Gray beat in $12/8$ time for Victor Herbert's "March of the Toys."

and exposure are not the same? There may be light and other conditions that render the use of the required shutter speed impossible. The query often raised in taking action pictures is, "How fast must the shutter speed be to stop motion?" It would be better to ask, "How *slow* a shutter speed may be used to stop the motion and secure correct exposure?" Applying the rule, we often find it necessary to use the angle of approach and no photographer interested in this work can afford to overlook this important modifying factor. The following sketch and explanation should be of interest.



In the above diagram the desired object to be photographed is clocked as moving past "X" in each instance at 22 feet per second. However, for all intent and purpose, as far as your camera is concerned, the object must be considered as moving at a different rate of speed dependent upon the angle formed when EF crosses BA at X.

With our camera located at "C" let us assume that the object leaves "B" and travels toward "A" at a rate of 22 feet per second. Here we have the greatest lateral displacement upon our emulsion and must use the highest shutter speed. When the object approaches "C" directly from "D" its lateral displacement is considerably reduced and the chief result of the speed is to enlarge the image. When the object approaches "F" from "E" at an angle of 30° (with line AB) the apparent motion is 19 feet per second. When the object approaches "H" from "G"

at an angle of 60° (with line AB) the apparent speed is further reduced to 11 feet per second. As the path of the moving object approaches a parallel to line BA the apparent motion increases. As the path of the moving object approaches a parallel to line DC the apparent motion decreases. This latter is desirable for cameras with a very low shutter speed. Therefore, when you take action pictures, get the angle that best fits the physical limitations of your camera. Objects rushing at you head on take the slowest shutter speed, and objects passing you directly as in the line AB take the fastest. Utilize the angle to cut down the speed of the object.

I want to point out that if the object required an exposure of $1/200$ th of a second



NUBIAN GOAT JUMPING

by Ralph Haburton

Exposure: $1/300$ sec. at $f:4.5$. It is no trick to get a Nubian goat to jump, but you have to be quick on the shutter trigger if you want to catch one in mid-air. A low viewpoint emphasizes the height, and eliminates much in the background that might be distracting. In many action pictures there is no opportunity to focus at the time of the action. If the action is toward you, focus in front of the subject and then make the exposure when the subject reaches the plane of focus.

traveling from "B" to "A", across the lens, when approaching along the line "GH" only 1/100th of a second would be required.

The next modifying factor is that of counter movement. If you are traveling in a moving vehicle in the same direction as the object to be photographed the object's apparent motion is reduced. Conversely, the motion is increased if you are traveling in the opposite direction. This is important in boat races when you are photographing from a boat moving with the race, or in airplane photography of birds.

IN photographing race horses you will find that the shutter speed ample to "stop" the apparent motion of body of the horse will not "stop" the legs and hoofs. These travel much faster than the body. The slight displacement of the legs and hoofs often "make" the picture by giving it the desired sense of motion.

In all reciprocal movements there is a point of suspended motion—dead points—and many pictures with slow shutter speeds may be successfully made by taking advantage of this factor. To illustrate: A pole vaulter climbs to his peak over the bar. When this is reached there is a dead point before he begins to fall. Successful exposures of 1/25th of a second have been made at this moment of suspended motion.

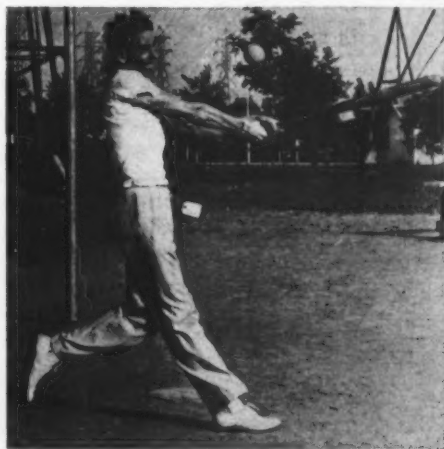
I mentioned earlier "panning" with motion. This is a really clever method of making action shots. You point the camera on the object as it approaches and follow the object making the exposure during the time of follow. Usually the object is found to be relatively sharp though the background is blurred. The blurring of the background gives a real sense of motion irrespective of the lack of apparent motion in the object.

To determine successfully the required shutter speed we must know the speed of the object. To save the reader much effort in making calculations I offer my own tables. The first covers the speed in inches per second of objects moving from 1 mile to 150 miles per hour.

TABLE I

An object moving—		
1 m. p. h. moves	18 inches per second	
1	36	" " "
2	72	" " "
3	108	" " "
4	144	" " "
5	180	" " "
6	216	" " "
7	252	" " "
10	360	" " "
15	540	" " "
20	720	" " "
30	1080	" " "
35	1260	" " "
50	1800	" " "
60	2160	" " "
75	2700	" " "
100	3600	" " "
150	5400	" " "

Let us presume you own a camera equipped with a five inch focus lens and your shutter's highest speed is 1/300th of a second. Can you secure a sharp image of an automobile traveling 30 miles per hour across the axis of the lens, fifty feet distant? I assume you do not intend to make too great an en-



1-300th sec. at f:5.6. Picture was taken late on a cloudy afternoon in June. The camera was focused on the batter before the pitch. Remember in taking such pictures the bat and ball present the fastest action. The bat will be shown with the least blur when it is in this position.



Coney Island

by Myron Benson

Taken at 1/200 of a second; f.8 with a K-2 filter. Bright sunny day. The plane was moving at 25 miles per hour.

larged print and that 1/100th inch displacement is sufficiently sharp.

The object is 50 feet, or 600 inches distant. Your lens being of 5 inches focus we note that the object moves 120 times faster than the image on the film. The permissible motion on the film is 1/100th inch, in this case 1/100 of 120 inches or 1.2 inches.

From Table 1 we find that the speed of the automobile is 30 m.p.h. or 528 inches per second. We thus get the equation $1.2 \div 528 = 1/440$ th of a second shutter speed. Since your fastest shutter speed is 1/300th you cannot take this picture.

But you can take this picture from a greater distance or from an angle. Let us see how far away the object would have to be. The highest shutter speed is 1/300th. The object moves 528 inches per second. By dividing the former fraction into the latter

figure we get the allowable motion of $122\frac{2}{3}/300$ inches. Lens focus is 5 inches, sharpness requires 1/100" displacement. Multiply 100 times the focus of the lens in inches by the space through which the object would pass during the exposure, or:

$$\frac{5 \times 100 \times 528}{300} = 880" \text{ or } 73 \text{ ft.}$$

If the object is 73 feet away you can make a successful exposure at 1/300th of a second.

If you wanted an enlargement of 5x, equally sharp, the circle of confusion (displacement) should be 1/500". By substituting 500 in place of 100 in the above equation, the answer would be 4400 inches or 366 feet, instead of 73 feet.

It is impossible to do more than approximate the speed of moving objects, but that is accurate enough. If you are willing to take the trouble you can compile the time of various athletic events and make up a table of relative speeds. For those who do not wish to bother here is my own table.

TABLE II

Trotting horses (ordinary)...	180 in. per sec.
Trotting horses (racing)....	468 " " "
Galloping horse	600 " " "
Fast train	612 " " "
Express train	936 " " "
Sea waves	504 " " "
Sailing boats	132 " " "
Steamers	180 " " "
Man walking at 3 m.p.h.....	54 " " "
Man jogging at 4 m.p.h.....	72 " " "
100 yd. dash in 10 secs.....	360 " " "
Flying birds	3540 " " "

The reader will of course realize the above table is subject to variations, depending on the man, beast or boat.

The shorter the focal length of the lens, the slower your shutter speed may be because the object image is smaller. Remember, however, that if you attempt to enlarge the negative object image to the same size as that made with a longer focal length lens, the shutter speed must be the same as that required by the latter.

I have said nothing about correct exposure time. This must be determined apart from shutter speed. If light conditions and the speed of your film are such that at $f/4.5$ you would under-expose at anything over $1/100$ th, and the speed of the moving object requires a minimum shutter speed of $1/200$ th, you are simply out of luck.

Table 3, which follows, concludes our discussion of snapping moving objects with relatively slow lenses. I have given data and suggestions which will enable those who care to go more deeply into the subject to compile special tables for their own individual needs. A point well worth remembering is that "15 m.p.h. equals 22 feet per second." From this it is a matter of a moment's calculation to determine other speeds. The illustrations accompanying this text were all made at shutter speeds not exceeding $1/300$ th of a second and a lens maximum speed of $f/4.5$.

The arrow shows the angle at which the object is approaching your camera.

TABLE III

The camera is figured at 25 feet from the object.	Focus 2"			Focus 5"		
	↓	↘	→	↓	↘	↻
Listed below are the objects to be photographed.						
Street groups, slow moving.....		1/2 to 1/4		1/50 to 1/10		
Pedestrians or grazing animals.....	1/10	1/20	1/25	1/20	1/40	1/60
Pedestrians, etc., 3 m.p.h.....	1/15	1/25	1/40	1/30	1/60	1/90
Pedestrians, etc., 4 m.p.h.....	1/15	1/40	1/50	1/40	1/80	1/120
Vehicles, 8 m.p.h.....	1/30	1/60	1/100	1/80	1/150	1/250
Trotting horses	1/60	1/125	1/200	1/160	1/300	1/500
Foot races and sports.....	1/100	1/200	1/250	1/250	1/500	1/700
Horse races	1/125	1/300	1/350	1/300	1/750	1/900
Objects 50 feet distant.						
Boats (speed 10 knots per hr.).....	1/25	1/50	1/75	1/60	1/120	1/180
Boats (speed 20 knots per hr.).....	1/50	1/100	1/150	1/120	1/240	1/360
Football, games similar.....	1/50	1/100	1/200	1/125	1/250	1/500
Trains, etc., 60 m.p.h.....	1/125	1/200	1/350	1/300	1/600	1/900
Flying birds	1/125	1/250	1/350	1/250	1/500	1/1000
Aeroplanes, 100 feet distant, traveling 100 m.p.h.....	1/150	1/250	1/500	1/300	1/600	1/900

N.B. To find speeds for lens of different focal lengths multiply speeds under either of above by focal length and divide by the focal length of the lens used. *e.g.* Find the speed for a 3" lens of a horse race 25 ft. distant. Solution (object quartering in approach) $5 \times 1/750$ is $5/750$ divided by 3 or $1/450$ th sec.

Objects twice distant, the exposure may be doubled or in the above example about $1/250$ second.

Bear in mind that the above speeds are approximately corrected to compare with present shutter speed markings. Some shutters do not work at the designated speed and it may be necessary to use the next higher speed. The table speeds are figured for a sharpness required for contact prints, *not* enlargements.



HEYWORTH CAMPBELL

**A Pen Portrait of America's
Foremost Art Director and
some of his selections.**

By Frank Hunter



By George Maillard Kessler

TO the general public—that indefinable mass consisting of everybody except you and me—Heyworth Campbell is best known as the editor of the annual *Body Beautiful* series. A publisher conceived an idea that was as risky as it was exciting, namely, a book of nude photographs in which the human body would be depicted in honest, unashamed poses. To put such an idea into successful execution, the publisher needed as an editor a man whose standards of art and good taste would be beyond question. Hence Heyworth Campbell.

The truth of the matter is that Heyworth Campbell is the Paul Bunyan of the eerie half-world of publishing. Question any of his contemporaries and you will be regaled with as outrageous a collection of legends in the making as ever surrounded the lumberjack hero. Meet the man himself, and you are little better off. He takes a roaring, lusty delight in achievement, spreading before your eyes ten or a dozen new projects dazzling in their complexity, all the while talking a blue streak of art, design, typography, baseball and more elemental subjects—and still another legend monger has been created to spread the gospel.

Heyworth Campbell is one of the most interviewed men in America. Every time you pick up one of the snootier sheets, there is a Campbell yarn staring out of the page.

We've dug out a picture of him—and we're publishing it for its museum value—that is an approximate representation of how Heyworth will look when he's stuffed. It was probably taken while his wife, Jackie, stood just out of camera range brandishing a snickersnee to make him sit still. But it is no more a true characterization of Heyworth than a white streak across a picture is a bolt of lightning.

IT was my good fortune to be associated with Heyworth on a photographic venture far off the beaten track of previous experience. If I learned nothing else, I realized any attempts to capture the flavor of his multiple personality would succeed only by indirection. He edits pictorial collections such as *Body Beautiful*, *Children In Action*, *Camera Around the World*, and *Modern Masters of Photography*. He designs new magazines and redesigns old ones. Put it like this, from the words of Condé Nast, for whom Heyworth was Art Editor of *Vogue*, at the ripe old age of twenty-four!

"His (Heyworth's) keen sense of decoration and proportion and his almost instinctive appreciation of every form of beauty have given to the editorial pages an individuality and distinction that are wholly his own . . . created a style for magazine pages which has been widely followed or more or less adopted by other magazines, not only in America and

England, but in the capitals of Europe as well."

Sounds pretty? The picture goes something like this: You're a publisher and you need a fine art editor or a designer so you call in Heyworth Campbell. Presently a nice man arrives who fixes everything and after a while sends you a bill. And you both live happily ever after. Heh, heh, meant as deep, bitter laughter.

Heyworth's prompting genius is a black demon, one of those imps two feet high, with vine leaves in his hair and carrying a fork with two prongs. Every so often the demon gets tired of supplying good ideas and suggests, "Come on, let's have some fun."

If you work with Heyworth Campbell, you are expected to be able to take it, and how. If he ever gets tired, none of his associates have been able to stick around long enough to testify to it. Half a day spent with him is an excellent preliminary to a nice quiet nervous breakdown.

Heyworth Campbell has never mastered

the mechanism of simple time. Although he is nigh onto fifty, the realization has still not percolated through that you can't be in several places simultaneously. Under oath, I may grant that he suspects this cosmic truth—but he keeps trying nevertheless. For example, you have an appointment with him and, hours later, trace him to another office where he learns, to his daily consternation, that spending three hours with one client will make him just that much late for his next call.

This momentarily shakes his confidence in a higher justice. Twenty minutes later a cautious footstep is heard outside your door. A battered felt hat sails over the transom and is followed by silence. If the hat is not thrown back, Heyworth rushes in and seizes you in a powerful embrace that carefully ties both your arms to your sides. If you address to him dark words of wrath, he will set up such a heartbreaking outcry of injured innocence that anyone within earshot—approximately half a city block—will despise



H. S. Ulan

you for the rest of your life. After which he's yours indefinitely or until some other irate client tracks him down.

YOU can judge a man, it is reputed, by his hobby and friends. Heyworth's hobby is telling very long, funny stories. As to friends, you may have heard of the Dutch Treat Club. This is an organization in which all the more dangerous maniacs of photography, designing, publishing and allied black arts have banded together for their mutual confusion. Once a year the Dutch Treaters let down their hair, take out their teeth and generally go to town. To commemorate the occasion, they bring out the Dutch Treat Book, a ribald, irreverent volume in which the members vent their spleen, gibber and gibe at customs, institutions and the more dignified members of what is known as the Better Element. It's a fearful and wonderful volume for which as much as twenty dollars a copy has been offered and scornfully refused. For the past two years, Heyworth has been chairman of the committee of cheerful lunatics who concoct it.

This month witnesses the appearance of the latest Campbell miracle. You know *Photoplay* magazine? This month it bursts out on the stands in a new garb that will take your breath away. Heyworth's name appears as art director. With this appearance of *Photoplay* the chances are ten to one that the course of magazine publication history will take another shift.

... But we were talking of *Body Beautiful*. With characteristic cocksureness, Heyworth took on the editorship of a book loaded with potential dynamite, enough to blow any average man who took the job and bungled it, right out of a lifetime's reputation. He made only one stipulation:

"Under no circumstances must

any figure be shown partially draped."

Sounds strange, but the logic is good. The unclothed figure has beauty, dignity, grace. Add a pair of black stockings or a copy veil, and you have something smutty.

Body Beautiful was published once, twice, and is now ready for release in its third series. The books have been sold not only by art and photography dealers, which was to be expected, but by orthodox department stores as well. The book has proved conclusively that there is fine art in the nude and proved it, what is more, to a general reading public largely ignorant of art standards.

Reproduced herewith is a hasty pictorial survey of *Body Beautiful*, now in preparation.

(Page 83, please)



Dayton Snyder

Photographing The INVISIBLE

By Augustus Wolfman

THE minicam photographer can take pictures with the aid of rays beyond the sphere of human visibility almost as simply as ordinary snapshots. You can achieve stunning cloud effects beside which your best previous efforts will look insignificant; you can get sharp, clear-cut images of mountains and landscapes so far away that they cannot be seen with the naked eye, you can turn day into night—you can even take pictures in total darkness!

Visible light is only a small portion of the sun's total rays. Below and above the range of human vision are invisible rays that the minicam photographer can harness to achieve strange and weird effects. Here is a branch of photography that requires no special equipment or knowledge yet produces some of the most different results being achieved today.

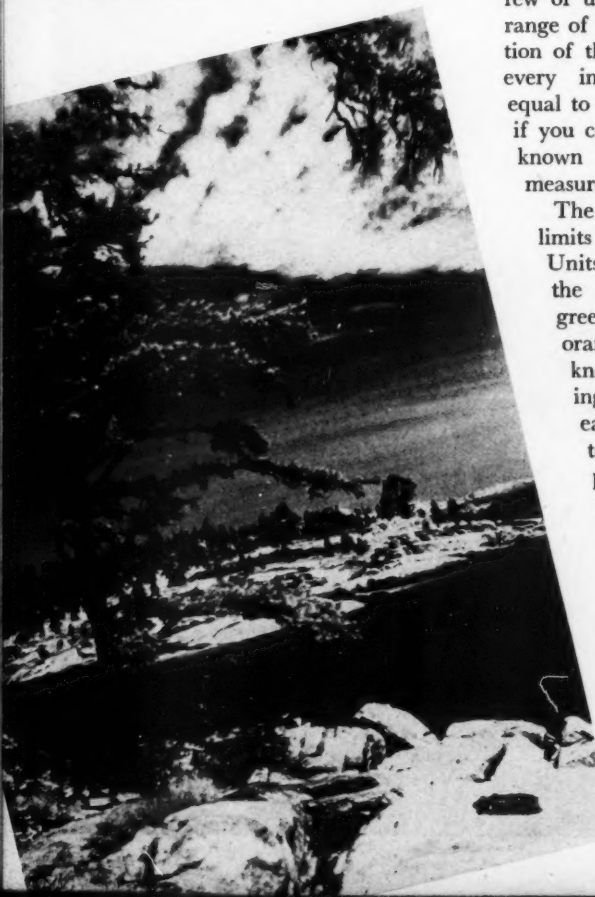
We all know light travels in waves and that what we recognize as different colors are light waves of different lengths. What few of us realize, however, is that the total range of human visibility is only a tiny fraction of the light rays bombarding the earth every instant. A unit of measurement equal to one ten-millionth of a millimeter—if you can conceive of anything so small—known as the Angstrom Unit is used to measure these light rays.

The human eye can see between the limits of about 4000 to 7000 Angstrom Units. At the lower end of the scale is the blue-violet, midway, the yellow green and at the upper end, the red-orange. This range of visible color is known as the "spectrum". Extending far below and above the scale at each end are wave lengths invisible to the human eye but nonetheless potent for all that. Just below the violet limit of the visible spectrum and continuing deep into the shorter wave lengths are the ultra-violet rays, while beyond the red or long wave group are the invisible infra-red rays.

THIMBLE ISLANDS, CONN.

By Robert B. Speckmann

Data: Contax with Zeiss Tessar f 2.8, 50 mm. lens. Zeiss Ikon R-10 filter. Agfa infra-red film. Exposure 1/25 second at f 4.5. Good light at 2:00 p.m. of a summer afternoon.



It must not be supposed that the ultra-violet and the infra-red represent the outermost boundaries of wavelengths. At one end there are still shorter waves such as the X ray and the cosmic ray, while in the uppermost brackets, we encounter the radio wave lengths. For photographic purposes, however, we are concerned only with the ultra-violet and the infra-red, unseen waves whose action we can nevertheless record on our sensitized emulsions.

Ultra-violet light is abundant in ordinary daylight, especially at high altitudes, and ordinary films are sensitive to it; so it would appear that photography by invisible ultra-violet rays is a simple matter. It should be necessary only to employ a filter which permits just the ultra-violet light to act on the film.

These invisible rays are useful in making photographs of documents, paintings, etc., as they reveal details which are not ordinarily visible. But how to get ultra-violet rays into your work room? Mercury vapor lamps and

open carbon arcs are rich in ultra-violet rays. Even Photoflood bulbs will do though they are not an abundant source. The next requisite is a filter such as the Wratten Series 18-A to prevent unwanted ordinary light from getting at the film.

You know, of course, that the sun's rays coming through a closed window will not tan you, no matter how hot they are. The reason for this is that ultra-violet, or tanning rays, cannot pass through ordinary glass.

To engage in ultra-violet photography on any serious scale, it is necessary to have a quartz lens, which transmits ultra-violet rays freely. The ordinary glass lens in a camera absorbs most of the ultra-violet rays, passing only a narrow band. This, however, is sufficient for experimental work with documents and pictures. But when shooting in high altitudes, a light ultra-violet filter will frequently greatly improve general results. No increase in exposure is necessary.

Looking now toward the red, or long end of the visible spectrum, we find there a large

CASCO BAY, MAINE By Robert B. Speckman

Data: Contax with Zeiss Tessar f 2.8, 50 mm. Lens Zeiss Ikon. R-1 filter. Agfa infra-red film. Exposure 1/25 of a second at f 5.6. Good light at 3:30 p. m. Summer.





Data: One hour exposure. No other light, but the heat from the flatirons. The irons were not heated enough to glow, as one would suppose from looking at the picture. Eastman Infra-red negative material.

Courtesy Eastman Kodak Co.

region of infra-red rays which are, in reality, heat rays. Like the ultra-violet, these, too, are invisible, but a small band at the beginning of the region can be made to work wonders with specially prepared film. Infra-red film is supplied in a variety of sizes, including daylight loading 35 mm. cartridges by Eastman, Agfa and DuPont. The cost is very little above that of a good, ordinary film.

Besides its sensitivity to infra-red rays, the film also reacts to the blue portion of the spectrum. It is therefore necessary to employ a filter to eliminate this light. A red filter, such as the Wratten 25-A or 29-F, will serve the purpose.

The first thing you will discover when you begin to work with infra-red is that the sky reproduces practically jet black. Even though the sky, visually, is very brilliant, it contains little infra-red light. Since the combination of the filter and the special film *responds only to the action of the infra-red rays*, the effect is that of a very much under-exposed, or dark sky. Now if the sky also contains clouds, *these will act on the film strongly*. The results are those stunning cloud effects so characteristic in infra-red pictures.

One of the greatest uses for infra-red photography is to photograph distant scenes. The blanket of haze that acts as a curtain limiting our visibility is no barrier for infra-red rays. They pass right through it and impress on the film the images of objects which we could not see and, therefore, presumed were too distant to perceive. It is not actual distance,

but atmospheric haze which generally curtails our visibility.

Atmospheric haze is the shorter wave lengths of light—the blue, and the violet—scattered by the particles of moisture in the air. Infra-red rays pass through the particles as though they were wide-meshed sieves. Once the scattered mass of the shorter wave lengths of light are eliminated and only the long infra-red rays coming directly from the distant objects permitted to form the image on the film, a photograph can be had that reveals detail the human eye is incapable of seeing. *This is precisely what infra-red photography performs*, for it totally ignores the shorter wave lengths of light and utilizes only the invisible infra-red rays.

In your first landscape shot you are going to encounter another strange characteristic of the infra-red, namely, that green foliage photographs very light. This is the converse of the dark sky effect. When a red filter of the infra-red type is used with ordinary panchromatic film, green appears very dark in the print. However, green foliage reflects a large quantity of infra-red rays so that in infra-red photography it reproduces light.

The dark rendering of the sky, and the fact that grass and leaves appear to be bathed in light, yields unusual night effects with infra-red photography. The landscape looks as though it were illuminated by brilliant moonlight. There is another factor which contributes to making shots taken with infra-red light look like night scenes, namely,

shadows are devoid of detail.

Normally, shadows are illuminated by the diffused light of the sky, but since the latter is free of diffused infra-red rays, it does not lighten the shadows and they appear totally black. Therefore, if you want the shadows of a subject to reveal detail, you must place it near some object which reflects abundant infra-red light, such as green foliage or white sand.

Another use of infra-red photograph is to reveal in documents and paintings details not normally visible to the human eye but which can be penetrated by the infra-red rays. Frequently a suspected canvas has been photographed with the aid of the invisible infra-red rays and a second painting found underneath the one visible to the eye.

We come now to the question of exposure. This depends largely on guesswork. How can we determine correct exposure when we are photographing rays which we cannot see and to which our meters are not selectively sensitive? According to practical experience, the average exposure on a bright, clear day in full sunlight is about $1/20$ th of a second at f 4.5. In cloudy or dull weather, the expo-

sure should be increased three or four times. With artificial light it is merely a matter of making a few test exposures in order to determine the correct exposure with the light source employed.

Indoors or out, it is advisable, whenever possible, to give a few varying exposures on each subject. The brightness of light reflected from the subject is of no concern, for visible light intensity bears no relation to the intensity of the infra-red rays.

If you were to load your camera with infra-red film, place a red filter over the lens, and then without further ado make infra-red pictures, you would quickly find that in close-ups a plane other than that upon which the camera was focused would be sharp, and that pictures of distant scenes made with the lens set at infinity would be entirely unsharp.

The ordinary anastigmat lens is so corrected for the visible spectrum that all the visible colors of light will come to a focus in the same plane. This, however, is not the case with infra-red rays. This invisible light comes to a focus in a plane slightly further back than that of visible light. It is, therefore, necessary to rack the lens slightly further

Data: Wratten "A" filter. Exposure $1/25$ second at f 6.3. Eastman Infra-Red negative material. Courtesy of the Eastman Kodak Company.



out in order that the infra-red rays will focus on the film. On a 50 mm. (2 inch) lens, the differential is roughly about an eighth inch.

Some miniature camera lenses have engraved on the lens mount two index marks, one for normal photographing and the other as a setting when taking pictures with infra-red rays. The lens is focused in the ordinary manner and the infra-red index mark placed opposite the distance on the lens mount indicated by the regular index mark. This racks

mark is made on the lens mount for each position at which exposures are made, and notes kept so that subsequently you can determine at what position of the lens each exposure was made. The film is developed and prints made, and from the sharpest print in the group, the correct position of the lens for infra-red photography is deter-



MIDDAY MOON By Kenneth M. Swezey

Data: Leica with Summar f 2, 50 mm. lens. Red filter. Agfa Infra-Red Film. Exposure 1/10 second at f 6.3. Taken in bright sunlight. An excellent example of the characteristic moonlight effect obtained with infra-red film.

the lens out the proper amount.

With lenses that do not have such an extra index mark, it is advisable to engage in a little experimentation to determine where the second index mark should be placed on the lens mount. Place the camera on a tripod and point it at a distant object. A series of exposures are now made, with the lens first set at infinity and then being racked very slightly forward for each consecutive exposure or series of exposures. A definite

mined by a slight scratch on the lens mount.

Infra-red photography demands no special knowledge, equipment or radical changes in your normal working methods. Yet, despite its simplicity, it is a branch of miniature photography in which some of the most interesting and different results are being achieved. Buy a roll of infra-red film and do some experimenting yourself.

BUILD IT Yourself

A PORTABLE PHOTOGRAPHIC CHEM. LAB.

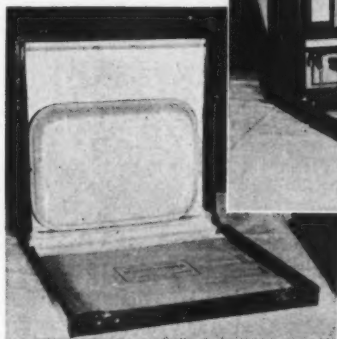


Fig. 1

Fig. 2

WHERE space is at a premium, this suitcase type laboratory solves the problem of storing laboratory supplies and equipment when they are not being used. The case, which opens on both sides, is 16"x14"x9" overall. The front compartment contains space for sufficient chemicals to mix the formulas usually encountered in ordinary work, in addition to a graduate, a stirring rod, and a balance, arranged as in Fig. 1. The rear compartment, Fig. 2, is 1½" deep, just large enough to hold three nested enamel trays of average size, and a package or two of paper.

The case, made according to the dimensions given in Fig. 3, is of ½" pine, except for the bottoms of the lids, which are ¼" plywood. The edges of the lids, to which are ¼" plywood. The edges of the lids, to which the plywood bottoms are glued and nailed, are of ½" material also, as are the inner partitions and the partition separating the front and back compartments.

The entire case is covered with imitation leather, after which suitcase fasteners and a handle are riveted into place.

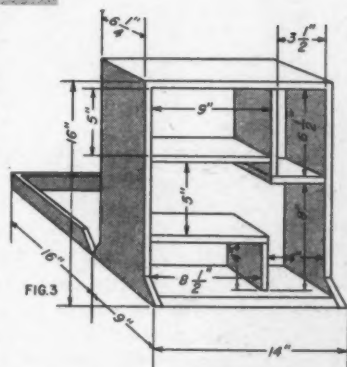


FIG. 3

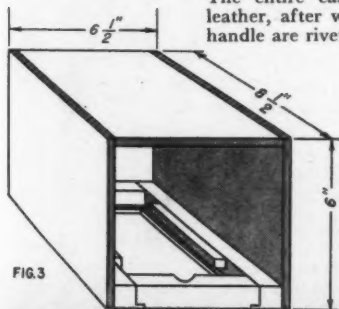


FIG. 3

SAFELIGHT LAMP

A COMPLETE safelight lamp, as efficient as any now being marketed, is well within the capabilities of the amateur. All that is needed is an old 5"x7" printing frame, some ¼" plywood, a safelight glass, a 10-watt bulb, socket, and wire.

To allow insertion and removal of the glass, one end of the frame must be removed. This is done either by sawing out a piece of the frame or by removing the end completely. The latter method is preferred. After this has

been done, two guide strips, seen in Fig. 1, are nailed in place so that the glass will slide in, and yet be held firmly. The box is then built around the frame and the socket fastened in and wired. After the bulb has been screwed into the socket, all that remains to be done is to slide the safelight glass into position and replace and fasten the end piece.

All necessary dimensions, as well as another view of the guide strips, can be seen in Fig. 3.

(Page 94, please)



Fig. 1

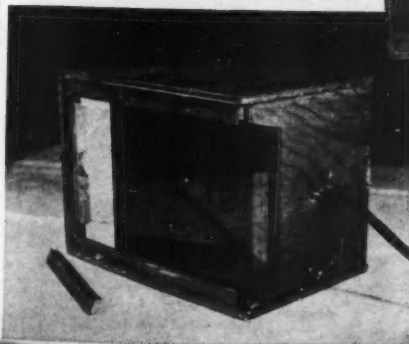
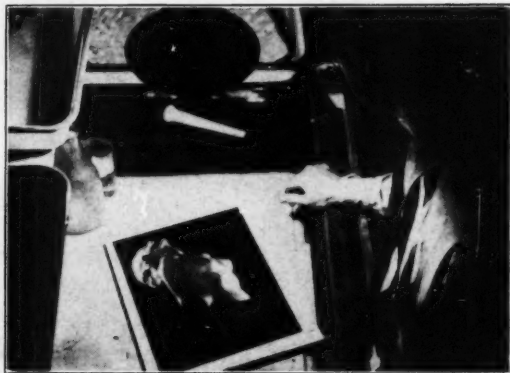


Fig. 2

STUDY IN LIGHT

by DUDLEY LEE

*How the picture
was made*



DUDLEY LEE has a philosophy. He says, "The photographer is an artist who uses a lens for his brushes and light for his paints."

In the accompanying striking natural color study Dudley Lee sought to carry this philosophy into action. His premise was to test the degree to which colored lights could be used in figure portrayal, abandoning what we normally consider skin tone and texture for the sake of a brilliant artistic expression.

To get a shimmering skin quality the model was first heavily greased with olive oil. The principal light source was a single heavy flood bulb in front of which was put a sheet of red gelatine. This light was placed to the right of the model. Since the colored light afforded poor illumination whose intensity fell off rapidly, another light, an ordinary uncovered Photoflood was placed on the opposite side of the model in such a way that it cast the necessary illumination to lighten the shadows. A third light, behind the model gave the backlight quality to the hair. No other lights were used.

The film material was Dupont Bipac, the camera a Leica equipped with an $f/2$ lens. The exposure was one-half second at $f/6.3$. From the two negatives thus obtained a paper print was made by the Wash-Off Relief Process in the following manner:

First the red-printer negative was given ex-

posure rather full and then the blue given normal exposure. Since in the Bipac there is no yellow negative, its effect was achieved by taking the red printer and exposing it again lightly and passing it through the same dye as the first, red print. In this way an acceptable yellow was produced.

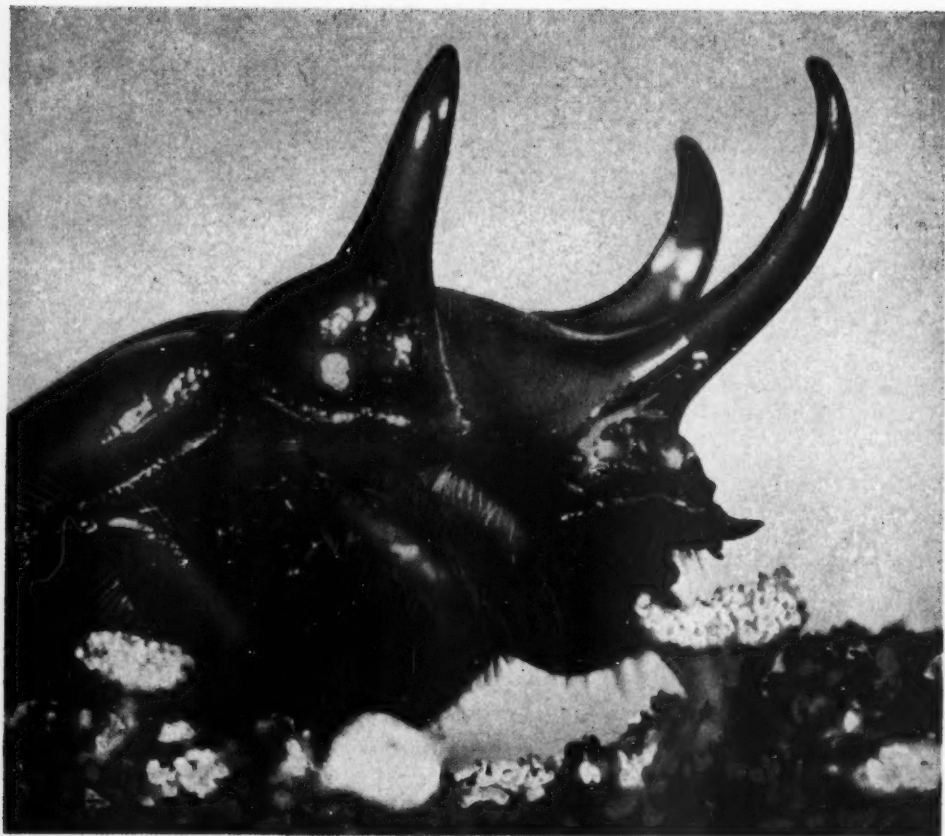
Finally the print was mounted, spotted and polished in the usual manner. In the accompanying illustration, Mr. Lee is in the process of preparing the final print.

Study In Light is worthy of attention not only for its powerful composition, but also for its successful exposition of a problem many workers in natural color now find confronting them, namely the degree of exactness to strive for in color reproduction. Here is demonstrated that color may be used for its own sake, in almost arbitrary fashion as dictated by the photographer's own concept.

Incidentally, *Study In Light* offers a further point that the amateur worker can turn to advantage. Glance at the picture. Your first impression will be of the unusual red skin tone. Now continue to study it. You will find, after a few moments, that you are no longer conscious of the unusual color and that your eye has accepted it as truthful tones.

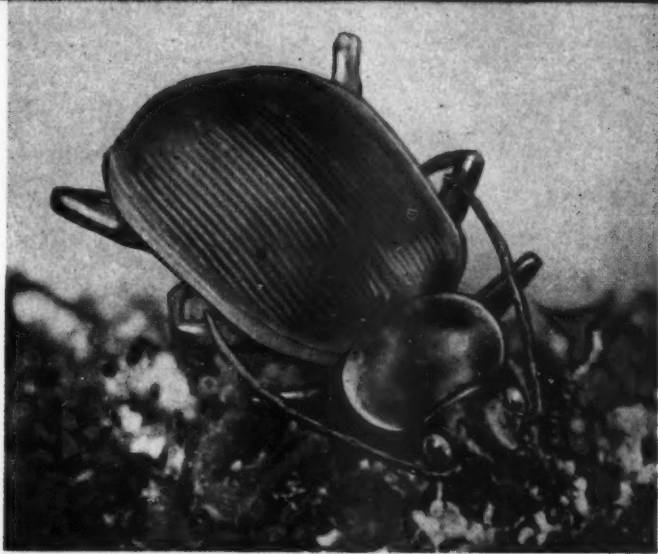
The answer lies in psychology. The picture employing unusual tones, without being bizarre, carries double force—the initial color-shock effect which draws the audience and subsequent acceptance, which proves actual literal truth in tone is not an essential. Were the skin tone, instead of red, a weak flesh tone approximating truth, its almost-correctness would be a constant irritation.





MINIATURE MONSTERS

Man's fate is a battle against the insect. Early in his history man learned to import insects to eat each other, thus leaving more grain for man. But insects multiply faster than a calculus expert with a slide rule, and the battle of man against insect is never ending. Among the insects pestering man are grotesque miniature monsters, decked out in full parade dress. You can nab them with your minicam, in full colors and enlarge them to monster size.





Trapping MINIATURE MONSTERS

By Herbert C. McKay, F.R.P.S.

A FAVORITE theme of fictioneers is that of the intrepid explorer lost in a valley inhabited by prehistoric monsters. Dragons twenty feet long soar majestically overhead while the long-necked Brontosaurus and his more dangerous kin lurk in the underbrush.

Your miniature camera can bring down game so truly formidable that if met face to face and size for size, any self-respecting saber-tooth tiger would flee for his life. And with good sense, too, for monstrosity is strictly a matter of relative size. If we humans were suddenly to be reduced to inch stature, we would find ourselves inhab-

iting a world peopled with horrors beside which a movie explorer's adventures would seem singularly uneventful.

Once you learn the secret, your minicam will level the difference in size between you and your quarry and without risking your life in the course of the experiment either. It will give you proof of the hunt in the shape of pictures guaranteed to be blood-

chilling enough for the most sanguinary taste. And, finally, if you will use color film you can reproduce these Lilliputian freaks in all the dazzling array of their natural hues and against their own vari-colored backgrounds. How is this seeming

There still are monsters roaming the earth fully as formidable as any museum specimen. The only difference is that they have shrunk in size until we no longer recognize them for what they are. Hunting these miniature monsters with the minicamera is the subject of this exciting article by our technical editor.

miracle accomplished? Through nothing more than miniature camera close-up accessories.

YOUR first requirement is the specimens, insects that zoom about your ear and commit enthusiastic suicide in the picnic jam. Don't try to take in too much territory at first. It is much better to keep within the limits of a single subject type until you know your way about.

One of the easiest groups to work with, and one of the most interesting is that which we call beetles. These insects come in many sizes, shapes and colors. Their chitinous body covering is usually polished and displays metallic colors of great beauty. The fortunate combination of texture and color as well as their strange forms makes the group ideal for beginners.

It is best to start with dead specimens. Beetles may be chloroformed and mounted upon a long pin as soon as they are dead. From time to time, the legs are arranged with a forceps so that when the insect hardens, the legs will be in a natural position. Posed thereafter on moss or other similar growth, it would take an expert to know they were dead at the time of exposure.

If you live in the city and have no opportunity to gather your own specimens, or if you don't relish fooling with chloroform, a visit or a letter to a dealer will get you anything you want. School supply firms and scientific supply houses usually have collections of insects from every corner of the world. Prices will range from as little as twenty-five cents up to ten dollars or more, depending on the rarity of your selection. In this game, as in most others, you can operate as frugally or as expensively as you choose.

Your next requirement is a setting. This consists of moss, pebbles, bits of twig, etc. You can gather it, or, if you live in New York, buy it cheaply from almost any florist, or get one of those prepared miniature gardens known

as terrariums. If you prepare a fairly elaborate set or get a terrarium, you can pose your specimen on it after you have made your picture and keep it as a permanent display. In that case you must give the insect a formaldehyde bath or it will supply a banquet for still smaller monsters.

Having secured specimen and setting, our next problem is photographic technique. There are two ways of making these pictures. The first, and to my mind the more satisfactory, is through the use of extension tubes and your regular camera lens. The second is by means of supplementary lenses without extension tubes. The first method is that embodied in the "reproduction stands" for miniature cameras, the second utilizes such devices as the Contax Contameter or the Leica Closeup adapter. If you are handy and have some patience and spare time, you can make satisfactory extensions out of cardboard tubing.

A wide-eyed woodmouse and a moth eye meet each other face to face on a pine cone branch.



The reproduction stand, with a tube equal in length to the focal length of the lens, provides double normal extension, which means that it will give you a negative exactly the same size as the original.

Your final picture, of course, is going to be very much larger than the original, either through enlargement in printing or, in

neither of them involving any great expense. The first consists of four silver-coated "bull's-eye" lamps. These are ordinary sixty watt bulbs which have been silver coated all over except for a round spot about the size of a twenty-five cent piece on one side. The silver provides multiple reflection which greatly enhances the power of the light delivered. These lamps get very hot so you must be careful not to touch them while they are lighted. Four of them will illuminate a set whose



Known as the "Nocturnal Peacock" this specimen of *Saturnia* moth is the largest of its species. Its wings are a reddish-gray with four spots on each resembling human eyes.

the case of color, projection. It is this breathtaking magnification by enlargement which makes the final prints so effective.

An optical bench, if available, is ideal but a table tripod will do the job nicely. Table tripods are so useful and inexpensive that every minicam worker should own one. It should have a head adjustable in all directions so that any desired angle may be obtained.

Proper lighting is essential. Ordinary photographic lighting, I have found, will not work. There are two effective lighting methods,

diameter is about the same as the distance from the lamps to the set.

The second method is to use ordinary, inside frosted seventy-five watt lamps. However, they must be placed in half reflectors so that as much as possible of their light falls fully on the subject.

The distance of the light source should never be more than ten times the length of the specimen, which means that the maximum lamp distance is eight to ten inches. This proximity of the light source provides

a lighting angle more natural appearing than the usual large reflector used at a considerable distance.

WITH the equipment assembled, the first step is to arrange the setting. The foreground may be of moss or lichen growth, but the background should be given attention, too. Pine branch tips are good, while a fungus from a tree makes a good movable background when it is desired to throw details into prominence.

Now place the insect which is to be photographed. Make certain that it is not hidden or dwarfed by the vegetation. When the proper position has been found, extinguish all but one of the lamps. Move it to give the best possible general effect. Naturally, there will be a great deal of black shadow. Extinguish this lamp and turn one on from the other side. Set this and then, in turn, the other two. When each lamp has been placed, turn on all four and watch the effect. If an unilluminated shadow remains, shift one lamp to fill it. Then look for reflections and move the lamps slightly to bring these into the most telling position. Finally, when the subject has any amount of metallic tone, place the lights so that they show this play of color to advantage.

Dominant hues of these insects are red-brown, red or greenish. If the predominating color is red or red-brown, I use Type A Kodachrome for reproduction. However, if it is a pure green, I use a very light blue filter with the Type A because the light is definitely redder than the Photoflood for which Kodachrome A is corrected. Without the filter, the green would be muddy in tone.

There remains now only the problem of exposure. First, you must bear in mind that the use of extension tubes radically changes the *f* markings of your camera lens. This involves a

very considerable increase in exposure time since the relationship between *f* numbers is as the ratio of their squares. Thus *f* 8, for example, is only twice as great as *f* 4. However, the square of 4 is 16 and the square of 8 is 64. The relationship between 16 and 64 is as 1 to 4, thus *f* 8 requires not twice but four times the exposure at *f* 4.

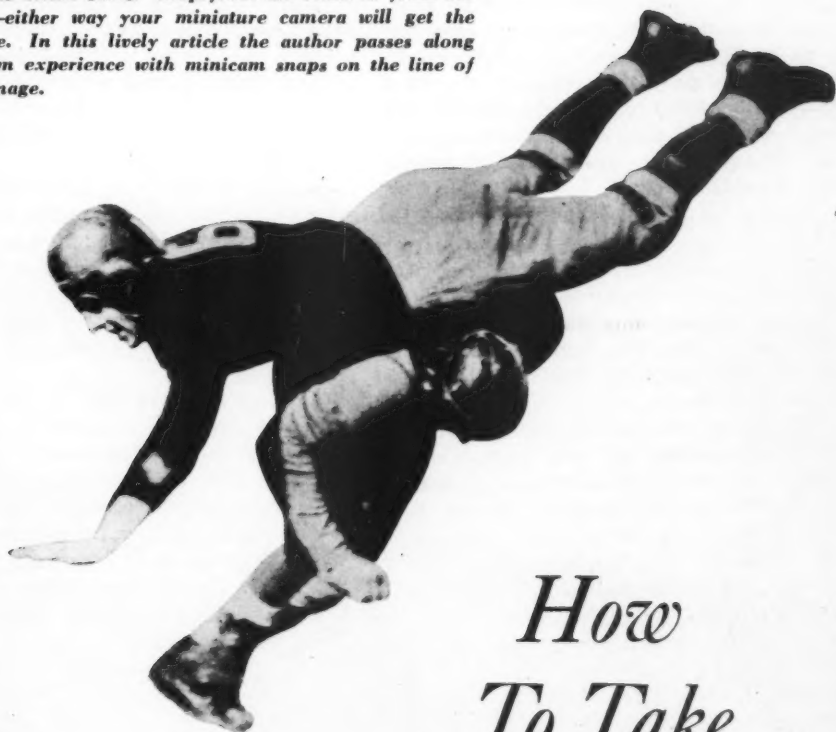
To spare you weary computation, I include below a table showing how extension tubes of varying sizes alter *f* markings. It is very important to consult this table when determining correct exposure. Note that factors bearing on the working *f* number are the extension tube, the focal length of the lens and its normal working aperture. To avoid the possibility of error, I suggest that so far as possible, you take your pictures at the apertures suggested in the table. The reason

(Page 100, please)

A butterfly, frog and snail make up this unusual family group. Once the photography of individual insects has been mastered group studies, such as this, present no difficulty.



Football season is here again and with it a chance at peerless action shots. Snap from the stand or from the field—either way your miniature camera will get the picture. In this lively article the author passes along his own experience with minicam snaps on the line of scrimmage.



How To Take

FOOTBALL PICTURES

By James H. Bell

THE time is one of those snappy October afternoons. There's just enough hint of cold in the air to make your blood tingle. The place is The Big Stadium, all flags flying, bands playing, forty thousand faces reflecting the excitement and drama concentrated on the field below. The occasion is the first Big Game of the year—twenty-two men matching their skill and strength, one against the other.

If your minicam is asleep on the shelf while

all this is going on, you're missing the opportunity of your life. Name any two sports you can think of, pause a moment to reflect, and then admit that between them you couldn't hope for half the diversified picture material you can find in an average football game. Football is not the great American pastime through any accident. Minute for minute and man for man, it offers the maximum in thrill and suspense, concerted action, individual

valor, a visible changing tide of fortune, comedy, pathos, even tragedy. And every bit of it can be captured by the minicam if you're ready and prepared.

YOU can take football pictures in one of two ways—from the stand or in the field. Each method has its advantages. Shooting from above, you can get unbeatable general views of complete team strategy, the local color of the stands opposite, the sweep of the field. Single players will rarely stand out. Instead, you get the game as a whole against its natural background.

On the field, your picture record will be mostly of personal drama, the shock of two colliding opponents, a pass being batted down, a try for a goal. You are going to have little or no opportunity to catch a play in its entirety but on the other hand, you will catch bits of individual action often too fast to be followed by the eye.

The happy medium, of course, is an adequate representation of both picture viewpoints. If you will take the trouble to make a tactfully worded request in advance of the game, you can often secure permission to shoot from the field sidelines during the second half, after you have finished your stand pictures.

When you are shooting from the considerable distance that separates even a good seat from the scene of activities, the need for special lenses is obvious. I have found two lenses, the 105 mm. (four inches) and the 135 mm. (five and a half inches) most helpful. On rare

occasions, the 200 mm. (eight inches) comes in handy. For all practical purposes, however, the 135 mm. is best suited and will take care of almost any contingency.

A tripod or some other support is important when you are working with a heavy lens. I think my hand is as steady as the average, but I have found that shutter speeds slower than 1/150th of a second without a tripod, blur the picture to the point where it is worthless. You'll be surprised, the first time out, to discover what a difference the weight of the lens makes.

Judging the strength of autumn sunlight is a tricky business. By all means use an exposure meter. And don't forget to take frequent readings as the afternoon passes. In the fall, the sun loses its brilliance rapidly after three o'clock. If you're not careful about your light, your last pictures will turn out under-exposed.

Play your exposure safe. If you're in the slightest doubt, open your lens an extra stop. Don't use filters when shooting from the stand. They are unnecessary and often a decided hindrance, as they cut down the speed at which you can take your action.

Working from the stand, you are at a considerable distance from the play and seldom broadside to it.

Navy attempts a Reverse Play, a highlight of the Penn-Navy game at Philadelphia's Franklin Field.—By James H. Bell.



That means you can use slower shutter speeds than you might at first imagine. I have found 1/100th to 1/250th of a second amply fast enough to stop most plays. This is important because most long focus lenses do not work at the large apertures that would be necessary for very fast shutter speeds.

On the field, your problem takes a different turn. Working close, I have found that the 50 mm. lens with an aperture of $f\ 2$ or $f\ 3.5$ is ideal. The speed, of course, is important now, and the short focus of the lens gives a satisfactory depth of field.

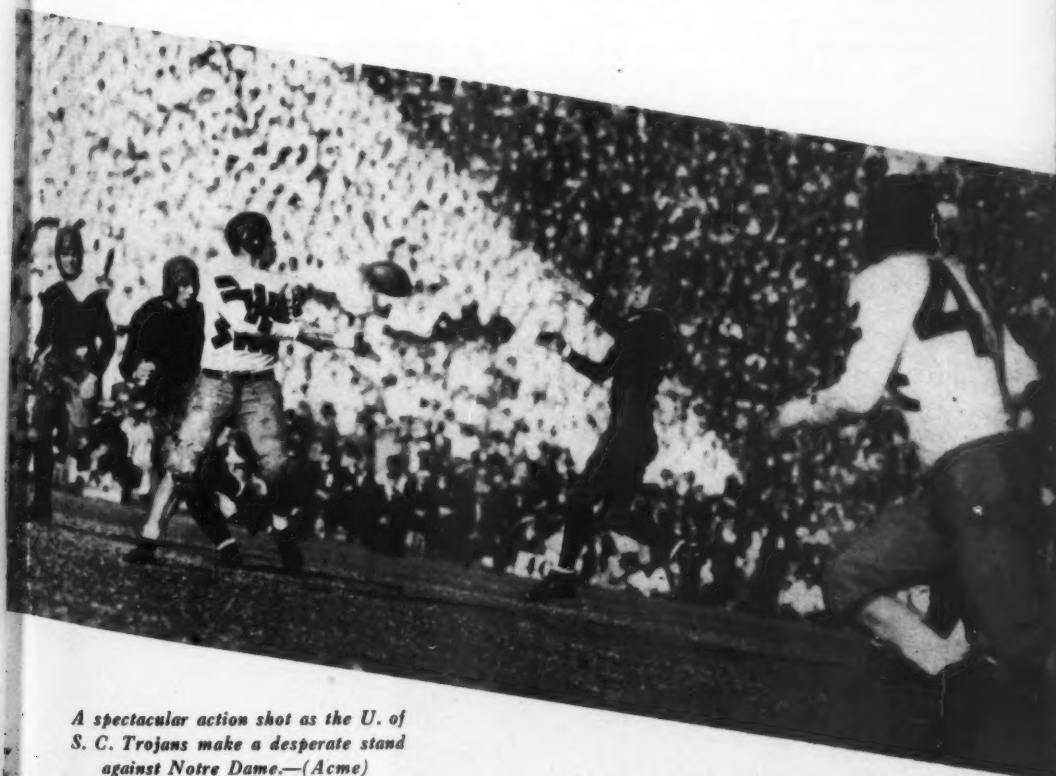
Over a period of time I have worked out a few dodges which materially improve results for me. For example, on the field it is important to keep the camera as close to the ground as is physically possible. This gives an effect of depth in the picture and also makes the players stand out in bold relief. Another thing. Don't be anxious to shoot the play

as soon as it gets under way. Wait until it reaches the line of scrimmage, since that is where most of the action occurs.

After you have gotten over your preliminary excitement, you will notice this: All the players are focusing their attention on one spot—the hole in the line where the offensive back is trying to get through. *There* is your picture.

When you want to shoot a scrimmage line, focus on the center of it and stop down your lens as far as possible compatible with light conditions. In that way, the depth of focus of your lens will enable you to get both sides of the line in good focus. But remember to keep your camera close to the ground.

Filters can be used to considerable advantage from the field. They will serve to increase contrast if nothing else and will frequently enhance the pictorial possibilities of your shot, especially if you can work in a good cloud effect.



A spectacular action shot as the U. of S. C. Trojans make a desperate stand against Notre Dame.—(Acme)

GETTING a good shot of a pass receiver while he is off the ground is a matter of about half luck and half dogged perseverance. Here is the method I recommend: Stop your lens down as far as you can compatible with a shutter speed of 1/250th of a second. Then focus your camera on a defensive half-back and see if your depth of focus covers an area of about fifty feet each side of the backfield man. If it does, you're set and all you have to do is hope for a pass to come his way. When the opportunity presents itself, get yourself set and blaze away. Don't expect a good picture the first time or even the first few times, but patience will eventually turn the trick.

Other shots that will present themselves are the kickoff, a player kicking the ball, a placekick after touchdown, open field running, sensational tackling and what not. Literally, the football field is a bewildering and ever-changing kaleidoscope of action. None



Above: A superb shot of a pass being knocked down. Note that the picture was taken while both receiver and opposing player were off the ground.—(Acme)

Below: Dancing in the dark.

of the shots represent any particular difficulty if you stay alert and follow the action of the game.



Professional football, by the way, is a practically inexhaustable mine of good pictures. There may not be as much material for colorful sidelight pictures, but when it comes to fast, furious and fancy football, the pros have what it takes. For one thing, the game is faster and features more open work, passes and broken field running. For another, the pro teams take a more practical attitude toward the value of publicity, thereby increasing your chances for getting on the field.

HERE are two bits of advice that may spare you some of the headaches I have had. First, take your really fast action shots early in the afternoon, while the light is still good. Second, don't bang away right at

the start or you will use up all your film on unimportant shots. If you follow football at all, as who does not, you know that some of the most stirring action takes place in the last few minutes of play. If you are out of film when the losing team is making its desperate, final gamble, you are likely to miss some pictures whose memory will give you pangs of regret for years. It's a lot better to go home with a few empty frames than to feel you have missed the shot of a lifetime. Ask me, I know.

A few parting shots. Don't make the mistake of working at too slow shutter speeds, particularly if you are on the field. Don't let those boys fool you. They move a lot faster than you think.

Watch your light and be sure to play it safe. That means an increasingly greater aperture which, in turn, means that you are steadily cutting down your depth of focus. It follows, therefore, that pictures covering a lot of territory must be taken earlier. That is why I recommended taking your general shots during the first half.

Keep your camera low at all times, if you can. And, finally, have an extra roll of film in your pocket, just in case. I presume, of course, that you would not think of working without a sunshade. All of the photograph

syndicates sell football pictures of the big games. They buy these pictures from free lance photographers as well as from their own men sent there on assignment. The address of the photograph syndicates are:

ACME NEWSPAPERS, INC., 220 East 42nd Street, New York City.
 ASSOCIATED PRESS FEATURE SERVICE, 383 Madison Avenue, New York City.
 CENTRAL FEATURE NEWS SERVICE, Times Bldg., New York City.
 CENTRAL PRESS ASSOCIATION, 1435 E. 12th Street, Cleveland, Ohio.
 GLOBE PHOTOS, 33 West 42nd Street, New York City.
 INTERNATIONAL NEWS PHOTOS, INC., 235 East 45th Street, New York City.
 LEDGER SYNDICATE, Independence Square, Philadelphia, Pennsylvania.
 NEA SERVICE, INC., 1200 West Third Street, Cleveland, Ohio.
 UNDERWOOD & UNDERWOOD NEWS PHOTOGRAPHS, 420 Lexington Avenue, New York City.
 UNITED FEATURE SYNDICATE, 220 East 42nd Street, New York City.
 UNIVERSAL PRESS SYNDICATE, Sarasota, Florida.
 WIDE WORLD PHOTOS, INC., 229 West 43rd Street, New York City.

In addition, newspapers buy pictures of football action scenes between local school teams. I mention these markets because some minicam fans occasionally are interested in selling a good shot in order to buy some piece of camera equipment they ordinarily wouldn't own.

Taken out of the play! A tense moment in the U. of S. C.-Oregon game at Los Angeles.

(Acme)



Stay-at-home PHOTOGRAPHY

By Jacob Deschin

THERE are occasions when even the best of us find ourselves "house-bound" for one reason or another. The cause may be nothing more serious than a persistent rain, or, again, it may be the lingering aftermath of that cold in the head. One way to spend such enforced leisure is to take a long nap. A better way is to play your photographic hobby.

Idle hours at home can be turned to amusement and profit with the aid of your minicam. There are many little jobs and tricks of photography of the sort you have always wanted to do but kept putting off for more important things. You've always wanted to try your hand at table-top photography, unusual still lifes, book-plates, and greeting cards. The chances are that you have the

house or apartment to yourself and that the state of the weather or your own physical condition makes you disinclined to go in for anything elaborate. Here is your opportunity.

A "table-top" is so called because for the sake of convenience the miniature, make-believe set is usually arranged on a table. However, there is no law that says you can't use the floor just as effectively if you feel so inclined. The floor, incidentally, is better when you want an overhead shot for some special effect as for example an air view.

In essence, the table-top is merely an arrangement in miniature of a number of simple elements, either selected from available sources or made to order, the whole imitating the real world without making a pretense to actuality. Thus the table-top lends itself to caricature or satire.

The trifle-treasure hunt is the table-topper's constant delight. He is always picking up apparently worthless things and putting them away for possible future use. Empty spools of thread have potential value and so



Fig. 1. If you have a few hours to spare why not try your hand at a still life? In this shot a few slices of bread, jam and a humble knife combine to form an attractive pattern against the checkered background. Still lifes such as these can be worked out with little difficulty.



Fig. 2. A bookplate for the domestic minded. The props are a small piece of black velvet, a common dish cloth, a plate and some salt for the lettering. See accompanying text for full description.

have bits of wood, pebbles, small dry flowers and what-not. Indeed, most of the useful items that go into table-top need not be purchased at all but improvised from whatever is at hand. If you are one of those people for whom the dime stores hold a perpetual allure you will probably have acquired a collection of tiny figures and furniture that you can now turn to profit.

The background for your table-top you can work out in several ways. The easiest is to use a sheet of cardboard, folded if you need two walls, or merely propped up if a single surface is enough. Or you can go a bit further. The table-top is an ideal medium for exploiting translucent materials for background purposes. Thus a sheet of tracing paper can be tacked to a rude framework and a moon simulated by placing an ordinary flashlight in position behind the paper.

For such effects the lens of the flashlight should be removed and the light placed within an inch or two of the tracing paper. When such a weak light is being used or in any case where light is being transmitted through the background material to create a special effect, the illumination for the setting itself must be greatly diffused and weakened to prevent blotting out the effect of the transmitted light.

In Fig. 5 we see an example of a simple and amusing table-top. The "setting hen" is a potato grabbed out of the family dinner bag. Other props consisted of a single piece of wood and some excelsior to simulate hay. The entire set-up and actual shooting consumed no more than about a half hour.

Do not overlook the possibilities of oddly shaped pieces of fruit and vegetables.

Self-Portraiture

Self-portraiture is quite an art. It has often been said that photographers are the most camera-shy of all people, but surely you can bear to have your physiognomy recorded if there is nobody present to offer supposedly helpful comment? In self-portraiture you can work out many tricky angles and effects. You can photograph yourself in the darkroom, in the act of using another camera, if you are opulent enough to own two or you can make a mirror picture. Again, you can work out combination and impressionistic effects since you have only yourself to please.

Fig. 3. A minifan's bookplate. A single light, a sheet of cardboard and a few empty film spools were sufficient to work out this bold composition. This basic design is capable of endless variation by shifting the angle of light and the position of the spools. If you are proud of being a minifan, here is your chance to proclaim it to the world.

EX LIBRIS



HOWARD L. KEANE

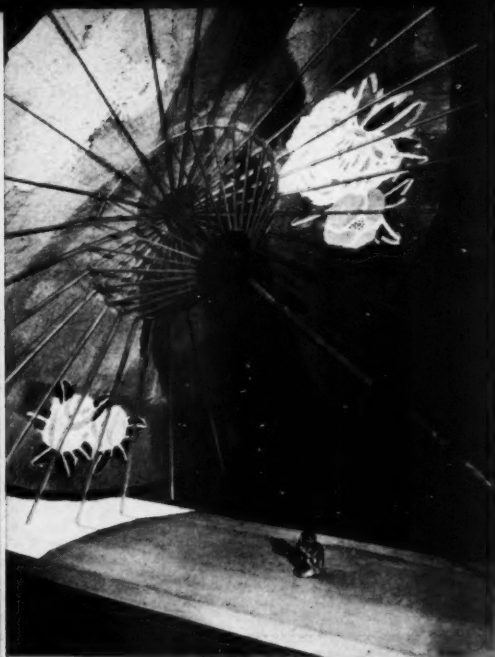


Fig. 4. A Japanese parasol from the five and dime and a monkey from the same source are the only props in this provocative variation of a still life. It would make an admirable design for an end-paper or book-plate. A single light behind the parasol brought out the pattern, as detailed as the text.

Self-portraiture by candle-light is a relatively neglected phase of this field which the stay-at-home amateur is sure to find attractive. Fairly long exposures are needed, but not so great as you might imagine. At a distance of two feet from the object and a two or three second exposure on moderately fast film at $f/3.5$, one thick candle will provide sufficient light for a portrait.

In all self-portraits the problem, of course, is to "fire" the camera without the aid of an assistant. There are several ways of accomplishing this. If your camera is equipped with a built-in self-timer you have nothing to worry about. Failing that you have two recourses. You can purchase a self-timing accessory, of which there are many makes available, or you can buy quite reasonably an extra long length of cable release. My own inclination is for the cable release which, you will find, will lend itself to a greater variety of subsequent use than the self-timer.

Still Lives

Next to table-tops comes the still life, an arrangement of fruits, vegetables or other

suitable objects. The purpose of the still life is not to simulate reality but merely to create beautiful pictures of simple compositions. Many artists have maintained that the still life is the highest form of art in that it permits expression of the artist's ideals without too great distraction from the subject matter.

Be that as it may, a well executed still life is one of the finest sorts of pictures, the kind that will give you satisfaction long after the fun of making them is over. Here is a tip. With your first still lifes you will probably make quite small enlargements and, after looking at them, decide that they are not worthy of big prints.

Don't be fooled. You really can't appreciate a still life until you see it enlarged to 11 x 14 or even bigger. What seems to you a singularly unpromising picture will reveal unexpected charm in the larger size. That may seem difficult to believe, but it is an experience that many photographers have had. Give at least one of your pictures a chance to show what it really has concealed in it before you pass judgment.

The subject matter for still lifes can be anything you have handy. Fruit, vegetables, even a few slices of bread and jam will serve the purpose. The secret of success in this work is to keep your composition simple.

Fig. 5. Getting ready. The "hen" is a potato and the hay is excelsior salvaged from a packing case. The only other props were a piece of wood and dark cardboard for a background. Similar table-top photographs can be made of odds and ends about the house.

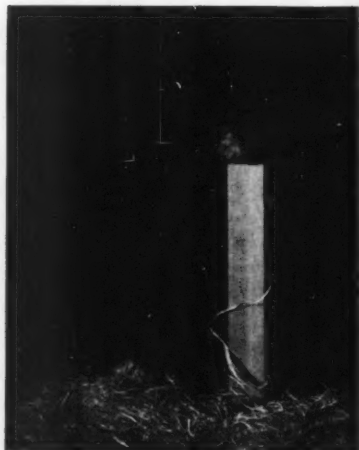


Fig. 6. Design for an end paper. When books are to be rebound or merely decorated it is often desired to substitute a decorative picture for the plain white flyleaf. Here is one suggestion, made from a discarded piece of batik cloth. As explained in the text, a light was used behind the cloth to bring out its pattern.

Fig. 1 is an example of a still life composition utilizing the pattern of a plate and a checkered background. Note the detail in the plate achieved by stopping down the lens to its smallest opening and increasing exposure time proportionately.

A variation of the still life is seen in Fig. 4. This picture really combines the technique of the table-top and the still life. The pattern of the Japanese parasol was brought out by a light concealed behind it in the manner explained earlier.

Greeting Cards and Bookplates

The table-top and the still life have uses other than merely pictorial. They can be made into end papers for books and worked into designs for greeting cards and bookplates. Fig. 6 is an example of a design for a book endpaper. Figs. 2 and 3 are examples of bookplates. Here is how the "web and plate" bookplate was made:

Against a background of ordinary black velvet an humble dish cloth is placed. It is pulled taut and pinned down outside the limits of the visible picture. At the upper left, where the owner's name is to appear a square of black paper was placed and held down with a touch of glue. The words "Minna Kraft's Book" were made with salt sprinkled on the paper! As simple as that. Sugar would

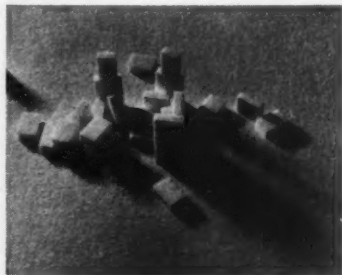
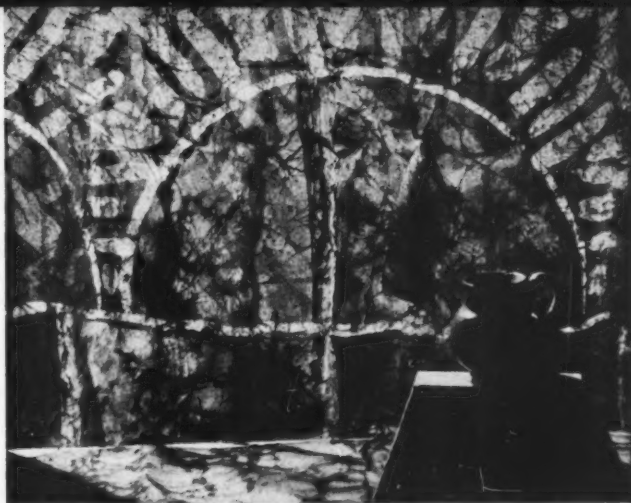


Fig. 7. Sugar cubes make a pleasing pattern for a photographic abstraction.



serve equally well. Finally the plate was placed at the lower right and the whole photographed from above. The result is an interesting and provocative design.

In Figs. 7 and 8 is shown how a casual design of sugar cubes can be made into an interesting composition showing form and mass. The two pictures are also an example of how framing and turning the negative can add power to a picture.

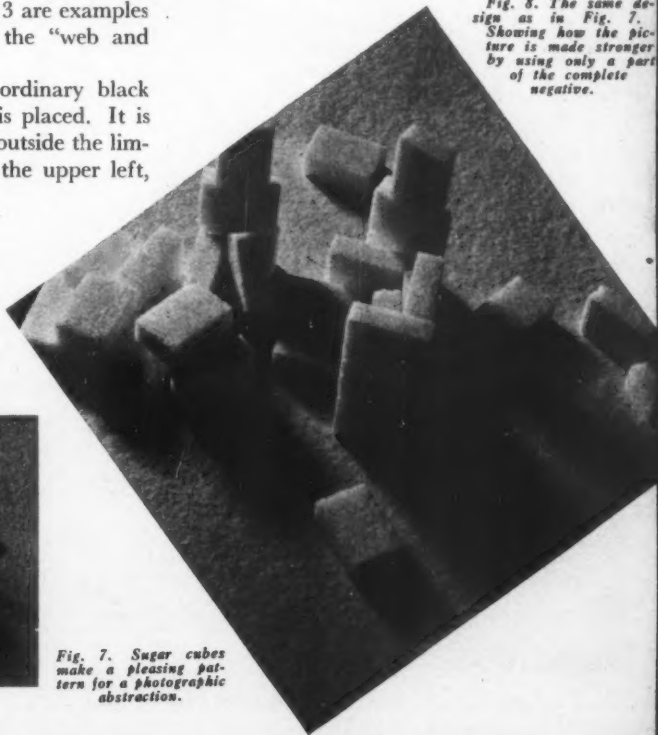


Fig. 8. The same design as in Fig. 7. Showing how the picture is made stronger by using only a part of the complete negative.

The Camera DETECTIVE

Identify the criminal, connect him with the crime, convict him. In each of these three stages the miniature camera plays a leading part. From the Crime Lab of the New York Police Department and from Louis A. Waters, consulting criminologist, come these authenticated instances of how the camera trapped desperate lawbreakers. Illustrated with pictures never before released from police files.

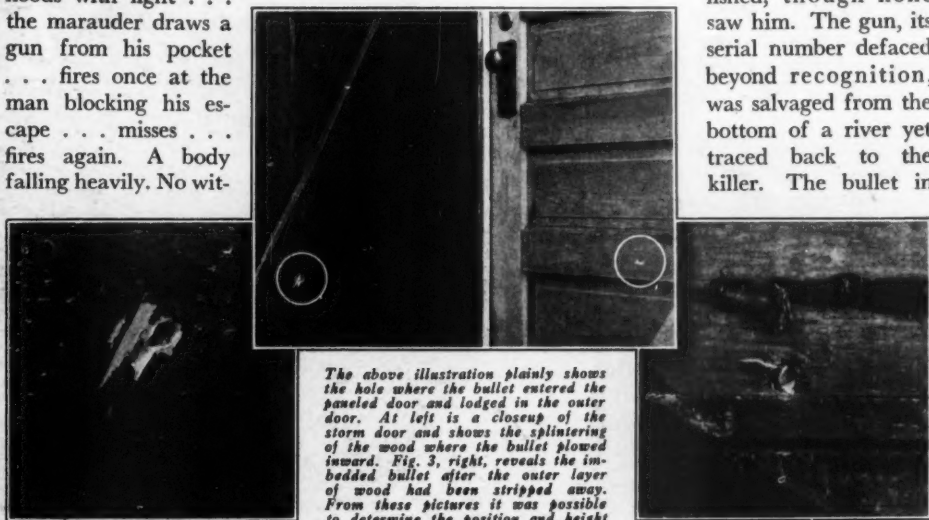
MINICAM RECONSTRUCTS THE CRIME

A SOFT footstep in the dark of the night . . . a shadowed figure, hands protected by silk gloves . . . turns the knob . . . soundlessly enters . . . stoops to loot a desk . . . stumbles against a chair. The room suddenly floods with light . . . the marauder draws a gun from his pocket . . . fires once at the man blocking his escape . . . misses . . . fires again. A body falling heavily. No wit-

nesses . . . no clues. The perfect crime—almost.

For it was not the perfect crime, after all. Within a week the killer was tracked down, his presence at the scene of the crime estab-

lished, though none saw him. The gun, its serial number defaced beyond recognition, was salvaged from the bottom of a river yet traced back to the killer. The bullet in



The above illustration plainly shows the hole where the bullet entered the paneled door and lodged in the outer door. At left is a closeup of the storm door and shows the splintering of the wood where the bullet plowed inward. Fig. 3, right, reveals the imbedded bullet after the outer layer of wood had been stripped away. From these pictures it was possible to determine the position and height of the killer.

the body was linked as surely to that gun, and no other, as though it had been autographed. Evidence piled on evidence until the day when the murderer, trapped in every direction, signed a confession. Another victory for the forces of order had been chalked up by—The Camera Detective.

Ride with the first squad from the Homicide Bureau and watch them at their work. First, the desk. Will it yield fingerprints? You will say, no, for some time has passed and the print will not show on the comparatively rough surface. But you have not heard of the *Inspectograph Camera*, a marvel of modern photography. With it a new type of fingerprint may be brought to light and photographed, the "latent" print from surfaces formerly thought non-retentive. It's a delicate and ticklish business . . . doesn't always work . . . but even once out of ten is a bet worth trying when you are hunting a mad dog.

This killer left his latent prints on the desk, but that was not all. His first bullet went wild, crashed through the thin door and lodged in an outer storm door. Once more the minicam got busy. Look at the center picture in the group comprising Fig. 1. The bullet hole in the paneled door is higher than that in the storm door and the splintering of the panel is greater below the hole than above, indicating that the path of the bullet was downward. Drawing an imaginary line between these two holes, and taking into account the position of the body it will not be difficult to tell not only where the murderer stood but *how tall he was*. More is coming.

Fig. 4.

A man was killed here. The shattered glass is from a milk bottle with which he was struck over the head. The bloodspots are easily discernable on the floor. Made with synchronized flash and auxiliary as described.

The second picture in the group shows a close-up of the bullet hole in the storm door, prior to probing for the stray bullet. The door had to be taken apart, but a jury will want to know what it looked like. Finally, the bullet is revealed in the third picture. All this accomplished with a minicam in less time than it would take to set up one of the old time 8 x 10 outfits.

Just as no two sets of fingerprints are alike, so no two guns leave identical marks on a bullet. Speeding through the barrel, a bullet is grooved with a set of scratches that stamp it as certainly as though the serial number of the gun had been engraved on the shell. When a gun was fished from the river bottom, a shot was fired from it—after it had been properly cleansed—into a protective matting. The recovered bullet was then ex-



amined and photographed under a microscope, its markings checked against those of bullets figuring in unsolved crimes. A classification system parallel to that used with fingerprints indicated where to look for its mate.

Ultimate identification was a matter only of patience. Now the two bullets were photographed, side by side, mute but undeniable evidence for the still distant trial.

How to trace the gun, with its serial number painstakingly eradicated? Once more minicam did the job, revealing by means of "horizontal light", numbers impossible for the naked eye to discern. (This technique of photographing serial numbers removed from machine parts has many extensions. It is re-

peatedly used to identify stolen cars, for example, when the original serial number has been either defaced or cleverly changed.)

The camera is today a most potent weapon in crime detection. From the initial photograph of the scene of the crime, justice, aided at every step by the camera, weaves a tight web of visual evidence that no amount of courtroom eloquence can shake.

WHEN you absorb over your morning orange juice the details of a sensational case that has been "broken" by the police, what is your mental picture? Nine times out of ten, detectives trailing a suspect, gun battles in the night, elaborate processes of deduction. These play their part, but have you

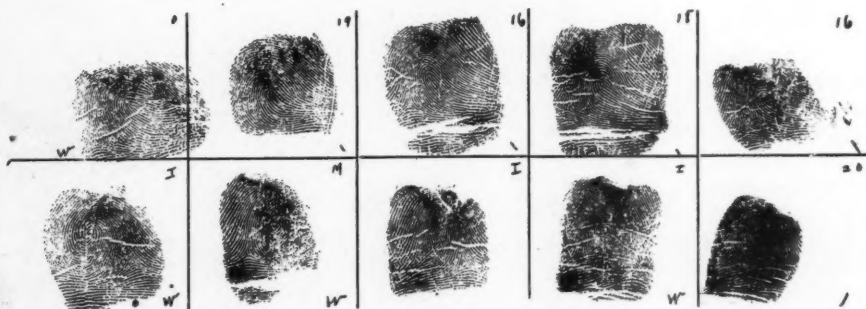
WYOMING STATE
PENITENTIARY
RAWLINS, WYOMING

\$50 REWARD
FOR THE APPREHENSION OF
JOE GEORGE DAVIS
NO. 5057

Fig. 5.

CLASS _____

REF. _____



Age, 48; Height, 5 ft. 8 in.; Eyes, Pale Blue;
Hair, Light Brown; Quite Thin; Weight, 135;
Build, Slender; Sallow Complexion.

Has tattoo of nude woman on right inner
forearm.

Sentenced January 9, 1936, from Natrona
County to a term of 2½ to 4 years for the
crime of Forgery.

Escaped July 12, 1937, while working
as a trusty.



WIRE ALL INFORMATION COLLECT TO

ALEX McPHERSON, WARDEN, WYOMING STATE PENITENTIARY RAWLINS, WYOMING.

ever heard of the New York Crime Laboratory where Deputy Chief Inspector John H. O'Connell and his assistant, Lieutenant William J. McMahon initiate the research that makes many of the other steps possible? Quite probably not. The New York police department is not anxious to give its Crime Laboratory methods undue publicity. For the most part it prefers to do its work quietly and unobtrusively, with the efficiency that

jury of twelve men that three presumably innocent citizens rate a vacation at the state's expense!

How the job of reconstruction was done, and the crime brought home to its perpetrators is one of the major miracles of present day police methods made possible by the miniature camera.

Here, in brief, is how the case was cracked. In an air-tight room and with the aid of delicate feather quills the infinitesimal bits of char were separated from the mess dumped on the laboratory table. With infinite delicacy the separation was accomplished and the fragile pieces of paper deposited on wads of cotton. Now close-up photographs were made with a minicam by means of colored lights. In all, a total of four hundred pictures were made before the proper combination of film, filters and lighting was hit upon.

... Walter Rathbourne, serving a sentence in Sing Sing, conceived a clever plan for clearing a fortune by counterfeiting the bonds of the Langendorf Bakeries, Inc., a West Coast firm. His coup was to net him enough to buy his way out of prison and to keep him



Fig. 6.
This scrap of char served to break the Forged Bond Mystery and was the direct evidence that secured the conviction of an entire gang.

has made the Department, under Commissioner Lewis Valentine, a model for many of the largest cities here and abroad. *Minicam* brings you a true inside crime story as it was unfolded—in the camera Crime Laboratory.

Case of the Counterfeit Bonds

Picture yourself in the boots of Detectives Paolo and Stevenson of the Crime Lab one sultry July afternoon. A cunning plot to counterfeit \$32,000 worth of bonds had been uncovered and the criminals responsible were in safe custody. But the bonds themselves, the evidence about which the whole case revolved, were burned to a crisp six days before. Not only burned on a rubbish heap in a vacant lot, but the charred remains thoroughly mixed with sand, pebbles, and refuse. As though this was not enough, three successive rainstorms had added their bit to obliterate what little might possibly have remained.

Now all you've got to do is reconstruct those bonds accurately enough to convince a



Fig. 7—The Inspectograph Camera made by Folmer Graflex for the detection of latent finger prints, as described.

free of financial care for a long time thereafter. Confederates were needed "outside", and found in the persons of Messers Davis and Libby. These gentlemen obligingly made a tracing of the bond design and passed it along to Rathbourne who whiled away the lonely hours in his cell by turning out a very neat engraving job.

The first slip-up came in the matter of contact with his accomplices. The woman designated to be the go-between aroused immediate suspicions and, all unknowingly, led police officers to their quarry. Posing as bond buyers, Lieutenant Grover Brown and Detective Henry Oswald established themselves in the confidence of the gang. A sale was about to be made when something went wrong. Arrests followed quickly, but not quickly enough. The evidence was gone. By the time the trail was once more picked up, all that remained of the bogus bonds was a sorry-looking mound of miscellaneous garbage interspersed with occasional bits of paper so delicate that a hasty breath would cause them to crumble.

Let's go back to Detectives Paolo and Stevenson in the Crime Lab and the story that now, for the first time, can be fully told.

A special hypersensitizing bath was used on the film, in order to make it active in the infra-red region. This consisted of 2 cc. am-

Dear May:

I was very disappointed Saturday when I found that you had been here and they wouldn't let you see me. You should have told them the truth that you were my sister instead of a friend and everything would have been alright. I am fine and have got a job in the cotton shop which suits me fine. I work hard all day and at night I am tired and go right to sleep. When I first come up here I was put in the cooler for a little argument I had for ten days but that is all straightened out now and I am now O.K. and being rehabilitated for society as the P.K. says. We got a ball club here gave the local cops an awful trimming Sunday which made me feel some better. We also have movies here twice a week and that helps some. If you see Manny show him this letter as he will be glad to know how I am doing too. Remember me to the boys and write the first chance you get.

Your brother,

George

Fig. 8—This innocent letter excited the warden's suspicions. Under black light it revealed . . .

Fig. 9 . . . this secret message.

Dear May:

I was very disappointed Saturday when I found that you had been here and they wouldn't let you see me. You should have told them the truth that you were my sister instead of a friend and everything would have been alright. I am fine and have got a job in the cotton shop which suits me fine. I work hard all day and at night I am tired and go right to sleep. When I first come up here I was put in the cooler for a little argument I had for ten days but that is all straightened out now and I am now O.K. and being rehabilitated for society as the P.K. says. We got a ball club here gave the local cops an awful trimming Sunday which made me feel some better. We

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Your brother,

George

monia (specific gravity .91), 275 ccs. absolute ethyl alcohol, 725 ccs. water at 50°F. The film was soaked for two minutes without rinsing, then dried quickly in a dust-free room. Exposure followed immediately.

Next the fragments of the bond, some only a half-inch in diameter were photographed as earlier described and huge blow-ups made. Point by point, these pictures, some hundreds of times enlarged, were checked against genuine bonds and proved false. Even the signature of Mr. Crum, Secretary of the Langendorf Bakeries, could be compared with several of the enlarged fragments rescued. Result, Davis and Libby received jail sentences and Rathbourne, his dream of wealth rudely shattered, had additional years in which to ponder the error of his ways.

In Fig. 6 MINICAM reproduces several of the tell-tale fragments, never before released for publication. Notice the clarity with which

the lettering may be read and then remember that what you see are scraps of paper, burned to a cinder, trampled, mixed with rubbish and exposed to three rain storms!

Case of the Model Prisoner

George was a model prisoner. After a few preliminary differences of opinion, he apparently settled down nicely into big-house routine. His letter to sister Mary, shown in Fig. 8 is an admirable example of decorum. Whether intended for May or the eyes of the censor who reads every piece of incoming and outgoing prison mail, there was still certainly nothing in that epistle to arouse the suspicion of even the most case hardened warden. Or was there? Notice the line:

"If you see Manny show him this letter..."

Now why should Manny, himself in none too good repute with the gendarmes, care about movies twice a week in the hoosegow. So the guileless letter was reread, more carefully this time. Still nothing wrong. Whereupon it was given the final test, minicam photography under "black" light.

Black light is ultra-violet light. You can't see by it, but the film in your camera is sensitive to it. Ultra-violet light sets up a chemical reaction in all objects exposed to it. It will reveal secret writing where even the microscope can't find it, will differentiate between apparently identical powders or solutions. It will instantly reveal even the most cleverly raised check.

Even more. In one of the greatest kidnap cases in history, the ransom money was cleverly marked with invisible ink that would withstand discovery under any known reagent. But when the money was photographed under black light, the identifying marks stood out for all the world to see.

George's letter never had a chance. Why he wanted Manny to read that chummy note is revealed in Fig. 9, a minicam photograph of the document as seen under black light. His particular reagent was simple enough to

use, once you knew how, which sister May undoubtedly did. Pass a hot iron over the letter and the hidden message would stand forth in bold black letters, visible for a few hours and then slowly fading out until the next application of heat. Clever, but not clever enough to pass the gimlet eye of the minicam!

Police science keeps march with criminal ingenuity, matching each new offensive weapon with a defensive just a little better. It is in the New York Camera Crime Laboratory that many of these defensive weapons are first forged. Crime marches on, and the minicam is a great aid in ambushing it.

Write for MINICAM

Would you like to write for Minicam? The editors cordially welcome the opportunity of examining manuscripts and photographs from their readers. We pay good rates for both articles and illustrations and report promptly on rejection or acceptance. To insure return of material, be sure to enclose full postage for return of rejected scripts.

What kind of material do the editors of Minicam want to buy? That's easy to answer. We want to buy what you like to read. If, in your experience with a minicam, you have solved successfully some fundamental problem that besets thousands of other fans, or if you have pursued an idea of your own in minicamera work and found it intriguing, then we want to know about it, and so do our readers.

The best way to sell us an article is to outline briefly in 150 words what subject you propose to treat, what pictures will illustrate it, and how you will present it. Enclose a stamped addressed envelope for the editors convenience in sending you a prompt reply. All letters following out the above suggestions will be carefully and cordially read. Address, The Editor, Minicam, 381 4th Avenue, New York City, N. Y.



SPECIALIZATION PAYS

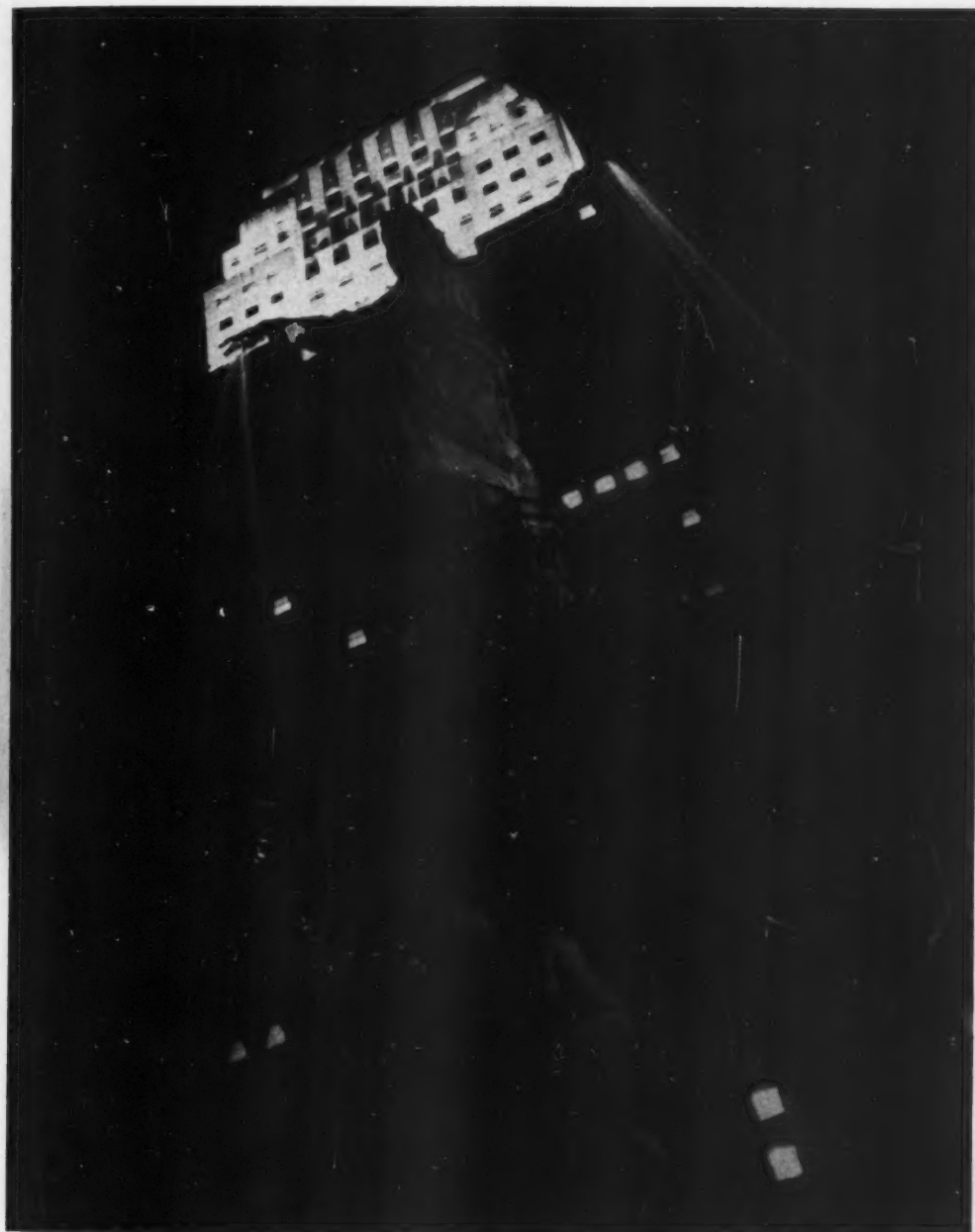
By Terry Wagner

Illustrations by Fred Connor

A FEW weeks ago I was privileged to examine what I consider one of the most unique photographic collections in the world. Its owner is one of those lawyer chaps whose work takes him to various cities, state capitals, etc., for special pleadings. In what little spare time he can manage he is an ardent miniature camera fan as are so many other professional men. What sets my friend apart, however, is that some years ago he

conceived the idea of using his many, and usually dull trips, to build up a collection of pictures of the theatres, music and town halls in all the cities he was compelled to visit.

No matter how small or staid a community may be, it almost always boasts one or more places of public entertainment. My friend made it his hobby to study and collect pictures of theatre architecture in every part of the United States. Offhand, you might think



TYLER DAVIDSON FOUNTAIN

by Richard Lorbach

Mr. Lorbach, an amateur minicam photographer of Cincinnati, successfully specializes in pictures of his city.

Night pictures such as this one can be taken with no light

other than that already illuminating the subject from nearby signs. This one was taken about 9 P. M. The exposure was 20 seconds at about $f 11$. (The exposure for this type of picture varies with the different subjects chosen.)

it a singularly unexciting idea but such is not the case. His pictures, numbering after some ten years, over fifteen thousand negatives are a rich mine of information on the changing manners of our times.

Within the past year my lawyer friend refused an offer of \$25,000 for the collection. Literally, it is too valuable to be permitted to pass into private hands and risk being broken up. More and more the old time theatres are disappearing and with them a phase of American culture that we can never recapture. His collection of pictures, started as an escape from the boredom of dreary small town evenings, will presently become the property of one of America's oldest colleges, to remain there a virtually inexhaustable fund of visual knowledge on American mores.

I am not suggesting that we should all go out and furiously start snapping every movie palace in the land in the hope that fifteen years from now our results may bring a like price. What I do say is that a camera, plus directed effort, plus opportunity, spell a combination it is hard to beat for enjoyment,

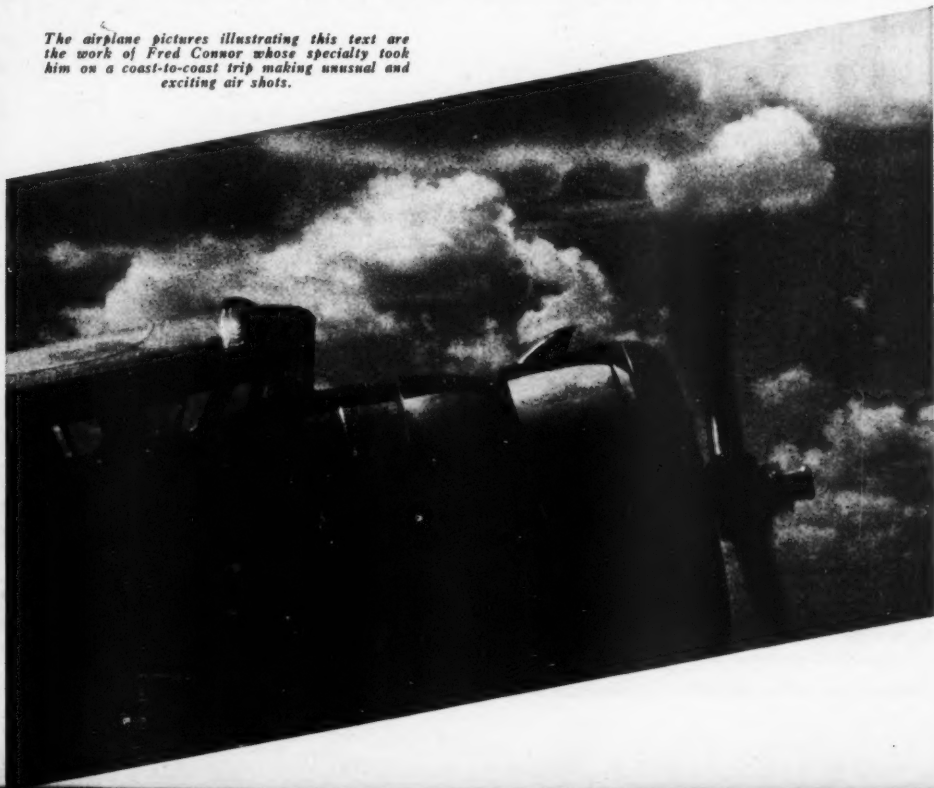
education and profit.

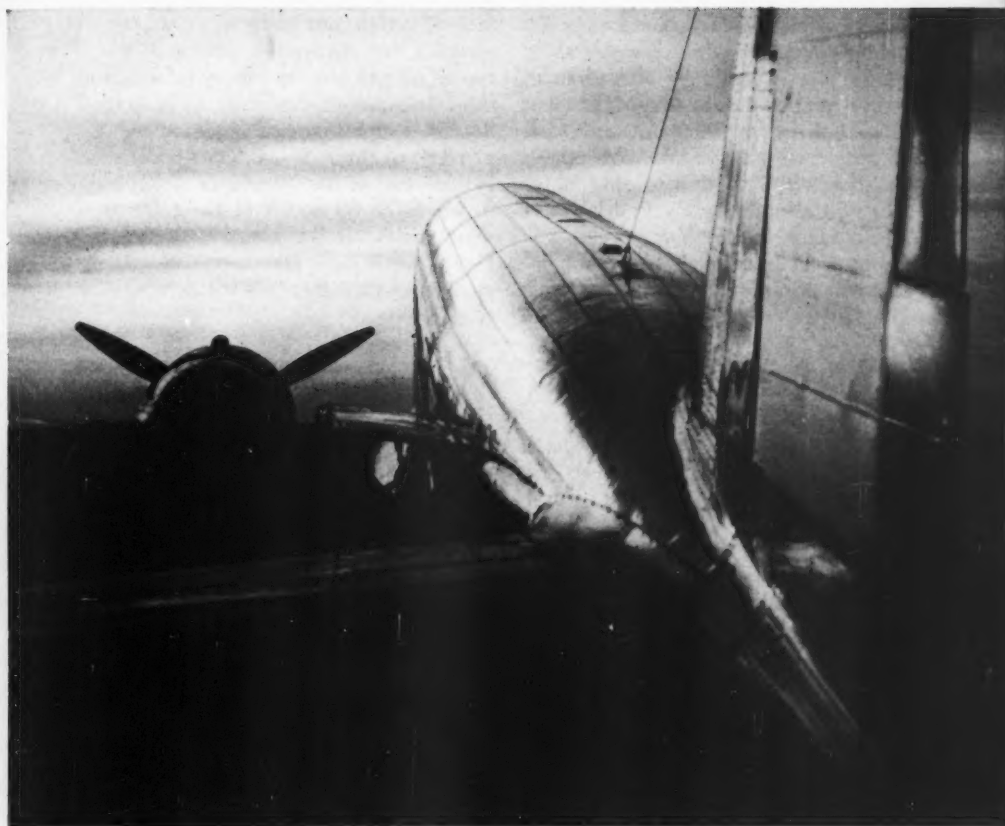
Consider another example. There are scattered about the country fans who collect pictures of locomotives. Not artistic pictures with wheels flying and contrasting cloud effects, but staid, matter-of-fact shots showing all visible parts in sharp focus. Some of the older examples of this technique are conservatively valued at \$100 or more a picture. Specialization pays!

Old automobile pictures are today at a premium. Tomorrow it may be old radios, the day after old airplanes. The point is that a consecutive group of pictures furnishing visible proof on all phases of any one subject is a valuable property.

In specialized photography, where the avowed purpose is to build up as complete a record as possible, a miniature camera is an essential. When you start multiplying anything by thousands, then space, not to mention material cost, becomes a real factor. It's all very well to own five or ten thousand negatives but you can't often afford to build a special wing on the house to store them. The collection must be complete, lend itself to

The airplane pictures illustrating this text are the work of Fred Connor whose specialty took him on a coast-to-coast trip making unusual and exciting air shots.





easy access and be protected from the ravages of time. Individual pictures must be made at a minimum cost. The difference between a cent and a half a shot and eight cents may not be much on a single afternoon's outing, but it runs into dizzy figures over ten years.

THESE requirements point to the miniature camera and preferably the 35 mm. size that permits thirty-six exposures on a roll whose tin container is the ideal storage box. In addition, the cameras are small, another potent advantage. There is always a spare corner in your valise into which the minicam can be tucked just on the off chance of running into a picture. You can slip the little instrument into your pocket while you go exploring in strange territory, comfortable in the knowledge that you won't look like one of those old-time itinerant photographers at whose approach little children screamed themselves black in the face.

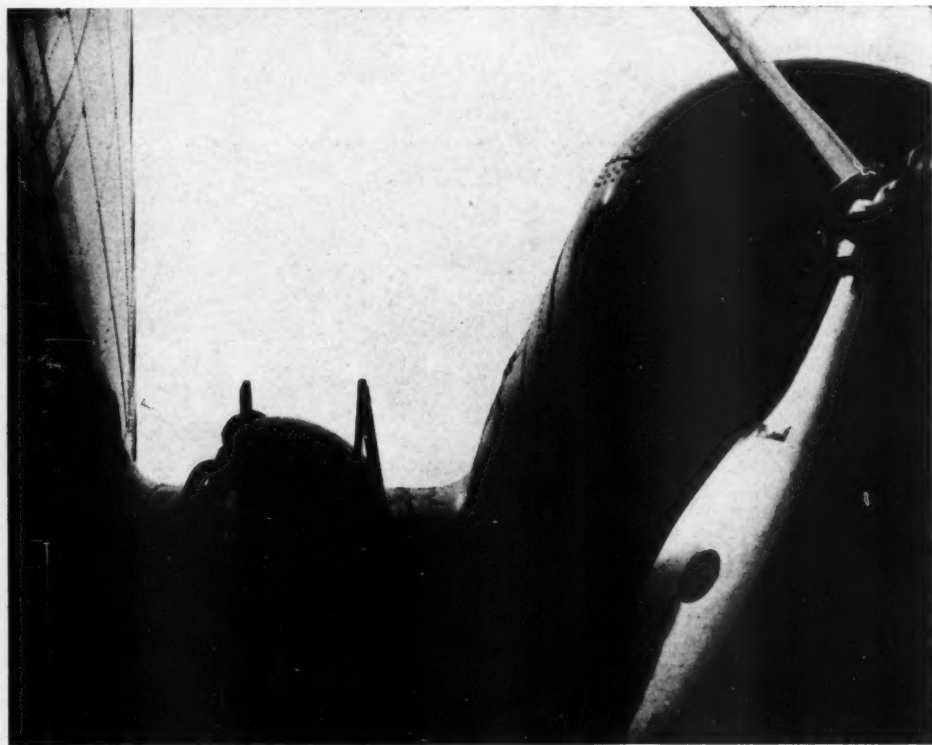
Your own hobby will, of course, depend on your interests; where you spend most of your time and how much of it you don't have to account for. Obviously, you can't collect varieties of California wild flowers if you spend eleven months of the year in Maine. But you could collect migratory birds under those circumstances, and a mighty interesting hobby it would make, too.

Don't select some subject at random because it sounds good and screwy, even though you don't especially care a hoot about it. You may learn to care, but, more likely, you'll get thoroughly bored in short order and chuck the whole mess out the window some fine night. Make your selection along the direction of your genuine interests or, if you haven't any, pick something that offers honest promise. You may still be wrong, but at least you'll have learned something.

Consider railroad stations, of which there

are probably more distinct varieties than any other public building. While you are at it, you might think, it would be nice to shoot the million and one kinds of freight cars that hang around them. A thousand times no. The two collections will get into each other's hair, you'll overlook good bets of one for poor ones of the other, you'll find a reefer car of the Podunk and Williams where you want a shot of Podunkville's Early Abberation Umbrella Stand. Specialization is a jealous mistress or, to put it another way, you

record, or documentary photography, and pictorial, or decorative photography. The record picture aims to convey information, to show as much of the detail of its subject as possible without particular regard for "pretty picture" quality. The interest is cumulative. No one shot of itself means or says much, but hundreds or thousands of them constitute a survey with all the sweep and power of a bird's eye view. The specialist strives for clarity — the other feller can worry about composition.



can't successfully ride but one hobby horse at a time.

Study out the possibilities of a hobby before you start whooping along. Some sound good, like types of antique glass, but don't lend themselves readily to pictorial treatment. Don't confuse things to collect like liquor labels, with pictures of them. Old labels are valuable, but pictures of them mean little.

There is one basic difference between

Always a good idea is to pick yourself a hobby thoroughly remote from whatever you do for a livelihood. This may sound inconsistent until you give it some thought. Hobby means fun and relaxation—a chance to turn your mind to some activity other than what you have been doing all day. If you're a laboratory technician it's no change to come home and fiddle with glass slides under a microscope. But if you are a house painter, the minuteness of photomicroscopy can and

probably will be a welcome relief. Pick your hobby for contrast and you won't go far wrong.

After you've shot as many as four rolls you'll need a filing system. If you wait until you've shot ten it's going to be hard to get organized. If you wait until twenty, the chances are you'll never do it. Put in a simple filing system right at the start. Similarly with contact prints. Get the habit of printing the last roll the same evening you develop the current one. Naturally you will enlarge the best shots, but you should also have contacts available on everything you do. Don't wait until you have accumulated a few hundred negatives before printing.

Handle your negatives with care! The casual picture you took this afternoon may

become your most priceless and irreplaceable possession a year from now. In developing put every roll through an acid hardening bath. Avoid using stale hypo that may later bring out stains on your prized films.

Specialization is fun, and it pays. It's not necessary for your collection to be the biggest or the best in the world. If it satisfies *you* and gives *you* pleasure it has amply fulfilled its function.

Minicam will pay \$10.00 each for all accepted photographs sent to us by readers who specialize in any one subject. Attach to your photograph 150 words describing your specialty, and why it interests you. Address it to *Specialty Editor*, MINICAM, 22 East 12th St., Cincinnati, Ohio.

DODGING

Ins and Outs

EVER stop to consider what useful photographic accessories your own hands may be? Nothing in your entire collection is so flexible, so easily manipulated. In "dodging" during enlarging, for instance, they are particularly valuable, constituting the simplest "device" you have.

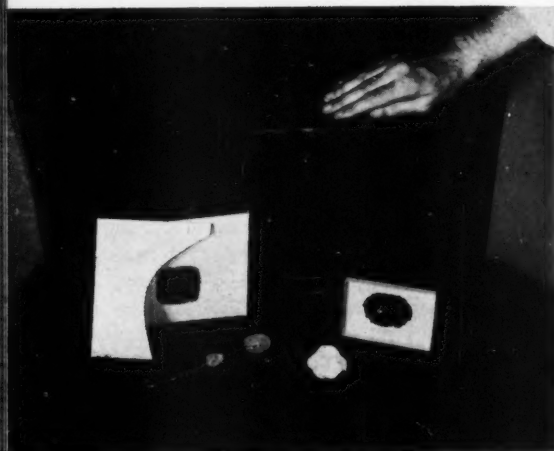
"Dodging" is the time-honored darkroom method of making up during enlargement for the deficiencies of photography or, it must be candidly added, for the inaccuracies of photographers. Here is the way it works out. Light makes the picture in the camera and light makes the enlargement on the easel, but while in the first case the disposition of the light is not always within your control, it is entirely so in printing the enlargement.

Suppose you project on the easel a negative image in which the shadow detail is abnormally lower in the tonal scale than the detail in the brightest highlights. For the best possible enlargement from this negative, you will want to show detail in both highlights and shadows. If you were to expose

for the highlights, you would lose or badly damage your shadow detail, and if you exposed for the latter, your highlights would very likely show little more than white paper.

In order to get both shadow and highlight detail in an enlargement from the negative mentioned, you will have to resort to some dodging. This is where your hands come in for their share in controlling the light coming through the lens of the enlarger. Project the image on the easel and, for a part of the time necessary to expose the entire picture, hold your hand or a couple of fingers between the lens and the easel in such a way that part of the image on the easel is in shadow and therefore unaffected by the light coming from the enlarger. The result will be that a shorter total exposure time, that is, less light, will be received by the shaded parts than those which received the full light from the enlarger during the entire duration of the exposure.

Excellent "dodgers" though your hands are, they are limited in their usefulness for this purpose to the part or parts which lie



DODGING DEVICES

1. *The hand*—A highly flexible shader which is always available.
2. *Glass plate with opaque central spot for holding back areas within the picture.*
3. *Fixed shader for vignetting a print by preventing the edges from printing.*
4. *Variable cardboard shader, the shape of the opening may be changed to suit the area.*
5. *Double internal shader for holding back two areas simultaneously.*
6. *Cotton shader for holding back an interior area, yet giving diffused edges.*

near the edges of the image. If you want to dodge an area inside the image, that is, away from the edges, either to give a relatively dense negative area more light than the rest of the image or a thin negative area less light, you will have to make yourself a dodger to fit.

A piece of cardboard or wad of cotton of appropriate size to cover the area to be shaded when the dodger is held somewhere midway between lens and easel is attached to the end of a wire and held in suspension for the required time. The cardboard should be serrated or its edge otherwise roughened and

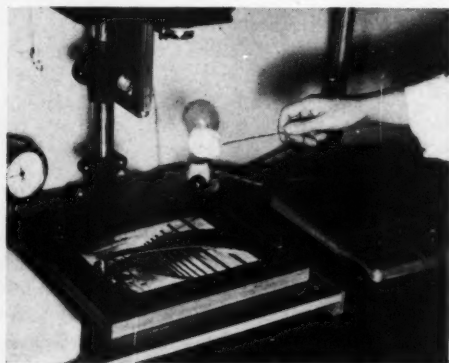
cated. Another useful method for holding back light from certain areas which must be shaded is a plain sheet of glass on which a piece of black paper or bit of cardboard is placed of appropriate size and shape to cover the area in question. For the dense area, you must make a dodger that will cover all of the projected image except the area to be dodged. To take care of this you will cut a hole in the card to let the light through to the little patch where more light is needed than has already been given to the entire picture.

The time to be allotted for shading or dodging in extra light for dense patches is, of course, governed by the transparency or density of the area involved. In general, where dodging is required, it is advisable to cut down the diaphragm of the lens in order to allow time for dodging not longer than about a third of the time required for making the entire print.

Washington Exhibit

A ZEISS IKON Exhibition of Photographs and Enlargements taken with Zeiss Ikon Cameras will be held on November 4th, 5th and 6th, 1937, in the Sun Parlor of the Washington Hotel at Washington, D. C.

This exhibition has been shown this year in a number of cities and has found many enthusiastic admirers. Now Washington will also have a chance to enjoy the wonderful results achieved with modern Zeiss Ikon Cameras.



The Dodger In Use

the dodger slightly agitated during use to prevent its outline showing on the print. The wire, because it is so thin, will have no effect and may therefore be safely used as indi-

A Filing System for

MINIATURE NEGATIVES

THE two most important factors in a good miniature negative filing system are the ease with which any given picture may be found and the completeness of information available concerning each individual negative. Of the numerous systems to be found for filing 35 mm. negatives, no one

original can. This, however, apparently does not allow easy location of any particular negative. To overcome this difficulty, each roll is assigned a number, which is marked on the blank ends of the roll and on the can. Likewise the exposures are numbered on each roll. A contact print from each exposure is

	ROLL NO.	EXPOSURE NO.
	FILM	DATE
	<i>ENLARGING DATA:</i>	
	PAPER GRADE	
	COMPARATIVE EXPOSURE	
TIME	COMMENT :	
LIGHT		
LENS		
STOP		
SPEED		
FILTER		

FIG. 1

combines these two factors better than the system herewith presented.

Handling of individual negatives is not only bothersome, but actually dangerous to the film. Strips of film, likewise, are liable to be damaged, and are also difficult to handle under most conditions. The simplest and most satisfactory method for storing and printing negatives of this size is to keep the roll complete, handling it only by the ends to prevent fingerprints, and storing it in the

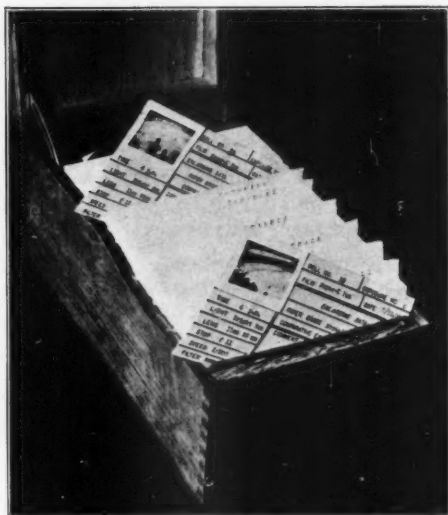
pasted to an index card, Fig. 1, on which there is also room for additional information concerning the exposure, as copied from the photo exposure book.

Space is also left on the card for enlarging information. The comparative exposure is simply the ratio of the proper exposure for a particular negative to that for a previously chosen standard negative, under the same conditions of size, light, and projection. This ratio is based on the fact that the change in

time of exposure due to external factors is always proportional to the density of the negative. By this is meant that if the standard negative needs an exposure of 2 seconds at a definite setting of the enlarger, the proper exposure for any other negative for which the comparative exposure is known may be found by multiplying the standard exposure, 2, by the comparative exposure, 5 for example. This would give an exposure time of 10 seconds in this case. Of course, any change in conditions requires the re-determination of the standard exposure.

Any additional information concerning the photograph may be written in the section marked "Comment", in the lower right hand corner of the card.

The cards are kept in an index file, Fig. 2, according to subjects. Each negative may be filed under as many subjects as desired, to facilitate its location. It is not necessary, however, to fill in all the information on the



The finished file box in use

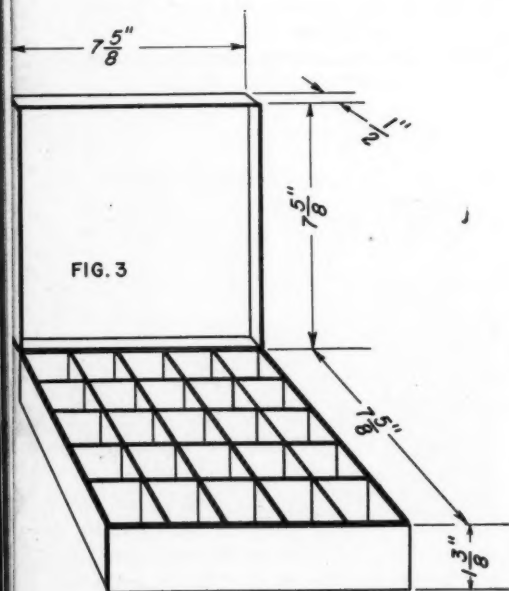


FIG. 3

NEGATIVE BOX

additional cards. All that is necessary is that each supplementary card have a contact print and the roll and exposure number, along with a cross-reference to the main card.

To keep the rolls of film in order, negative boxes, as illustrated in Fig. 3 are used. These may either be purchased or made at home. They should be of the dimensions shown, with the inner squares $1\frac{1}{8}$ " on a side. It is assumed that $\frac{1}{8}$ " plywood will be used. For material of a different thickness the dimensions must be changed accordingly.

Each box will hold 5 rolls of film, which, allowing 36 exposures to the roll, will give space for storing 900 exposures. By marking on the outside of the box the numbers of the rolls which it contains, any particular roll may be quickly located.

An additional advantage of this system is that the contact prints may be examined before any enlargements are made, thus allowing some selection of the negatives to be enlarged, and consequently effecting a saving in the cost of finishing the films.

PAPER PRINTS

From Natural Color Film

By Rowland S. Potter

II. The Chromatone Process

Prints in natural color, reproducing all the beauty of the original subject — the crowning achievement of modern photography—are possible by The Chromatone Process. In this brilliant article, the second of a series, Mr. Potter sets forth the advantages and simple technique of one of the most popular color printing methods.

THE Chromatone Process is one of the basic methods of preparing a natural color print on paper from a color transparency. In MINICAM, Sept., Dr. T. Thorne Baker described how color separation negatives are made from the natural color film. Here we will show how the complete print is achieved through the Chromatone Process.

If you have enough knowledge to make a satisfactory print in black and white, you can make a color print by the Chromatone Process.

If you can repeat a monochrome print, getting into it the same quality that you did the first time, you can repeat a Chromatone print. Therein lie the great advantages of this process. Every stage in the preparation of a Chromatone print is photographic. No outside laboratory tricks are necessary. From black and white positives toned images are made. The relationship between the black and white and the toned image is a constant one. It is not variable with personal or weather idiosyncrasies. You are not asked to bring to the task artistry or extra-photographic talents.

Outline of the Process

From the three separation negatives made as described last month, black and white prints are secured, either by contact or projection on Chromatone Print Paper. This paper was specially developed by the Defender Photo Supply Company and is really a thin stripping film. It looks like glossy double-weight photographic paper and is handled in the early stages of the process as though it were ordinary projection paper.

After exposure and development, and during fixation, it will be found that the photographic image is really on a thin, transparent collodion base which can be easily stripped from the paper. Though only about 1/1000" thick, the film is strong enough to withstand handling during the balance of the process which consists of bleaching, toning, washing and final assembly.

Briefly, therefore, the Chromatone Process consists of making three black and whites, on transparent film, each of which is toned as



will be presently described. These toned positives are then assembled in their proper order, one registered above the other. When fastened together and permitted to dry they form a single unit which is the finished color print.

The toning methods do not depend on dye absorption in any way but are direct conversion of the silver image, molecule by molecule, into metallic color images. Metallic tones have been described and used before, but the patented Chromatone formulae have been so worked out and adjusted that the depth and color of the respective images are about as theoretically correct as it is possible to obtain. Readers are cautioned against mixing their own solutions.

The Process in Detail

The color balance of the finished print depends on the care employed in making the black and whites. Ideal negatives, which include a neutral scale photographed with the subject, will record such scales in a practically identical manner.

It is quite important that the Chromatone prints be made under controllable conditions.

Fresh developer of a constant temperature, and using a standard time of development are essential. If your main line voltage jumps frequently (due to changing loads on the line) difficulty will be experienced in color control. With the Chromatone Paper, as sold, are furnished test strips. First determine correct exposure to obtain a print that you would consider a satisfactory black and white

print from the negative taken through the green filter (to be toned magenta), and reserve this for toning. Now determine with the test strips the necessary exposure to obtain similar neutral scales on the prints from the other two negatives. (If the negatives do not include a neutral scale, select some portion of the negative which you can surmise to be neutral, and use this as a guide to depth of print.)

Since the effect of toning is to alter slightly the relative strength of the images, the prints to be toned yellow and blue-green are not given the exposures just determined by the test strips, but are given increased exposures in the following manner: The print from the blue filter negative, to be toned yellow, must be exposed 25% longer than the correct exposure indicated by the test strip exposed from this negative.

The print from the red filter negative, to be toned blue-green, must be exposed 10% longer than the exposure indicated by the test strip exposed from this negative.

The second step in the Chromatone Process is the toning, which is divided into two stages, that of bleaching and the actual production of color. Five solutions are required:

Yellow Toner A	Red and Blue Toner B	Blue Toner B
Red Toner B		Yellow Toner B

After the black and white prints are thoroughly fixed, all the following stages of the process can be carried out in white light. A thorough wash of at least fifteen minutes is essential.

The stripped off black and white positive prints, intended for the magenta (red) and blue-green images are placed together in one tray; and the red and blue working solution (Red and Blue Toner A) made up as outlined in the directions accompanying the materials. This preliminary A toning is actually a bleaching process.

A swab of absorbent cotton, or a wide rubber set varnish brush is very useful to prevent all kinds of smear marks and uneven toning. The brush or swab should be used almost continuously and must not be transferred from one solution to another. The swabs can be thrown away after use and the brush

thoroughly washed before re-use. This practice is valuable in the first toning stages of all three colors.

Keep the toning solutions cool; not to exceed 70° F. With higher temperatures, loss of highlights may be encountered.

Immersion in the A solution should be continued for at least fifteen minutes, and, in any case, until all of the black silver is removed. When a print is thoroughly toned, it will appear as a light greenish-brown image. It is then placed in running water and thoroughly washed for ten minutes. Washing is of the greatest importance at every step, and must not be slighted.

It is also essential that the hands be kept clean at all times in order not to contaminate one solution with another.

After washing, the red image is placed in the Red Toner B and allowed to tone for about ten minutes. The solution is then poured off for future use, and the print immersed for three minutes in a Standard Hypo Solution. After it is again washed for about fifteen minutes in running water, it is ready for assembling.

Similarly, the blue image is placed in the Blue Toner B and allowed to remain ten minutes, after which the print is immersed in a tray of weak Hydrochloric Acid Solution for about one minute. Use one part concentrated Hydrochloric Acid with six parts of water. The print is then washed in running water for about ten minutes after which it is placed in a tray containing Standard Hypo Solution until greenish tones have changed to blue. After washing for about twenty minutes it is ready for assembling.

The Yellow Toning Solution (Yellow Toner A) is supplied in two solutions and must be mixed before it is used. The print to be toned yellow is immersed in this solution for about ten minutes. This work may be carried on simultaneously with the Blue and Red toning operations, separate trays being used.

After about fifteen minutes

the solution is poured off into a graduate, and 10 cc. (3 drams) of Standard Hypo Solution is added to every 50 cc. (2 ozs.) of working solution, and thoroughly mixed. Next, wash the print for one minute in running water, return it to the tray and pour the solution back on the print. This operation must be done quickly, and the tray vigorously rocked for about a minute to prevent streaking the yellow image. The print is allowed to remain in the solution for about three minutes, after which the solution is discarded, the print washed for a minute or two in clear water, and then immersed for about one minute in a solution made up of Standard Hypo Solution, one part, water three parts. Do not keep the print longer than one minute in this solution as the image at this stage is slightly soluble in hypo and highlight detail may be lost thereby. Wash the film immediately for not less than twenty minutes in running water.

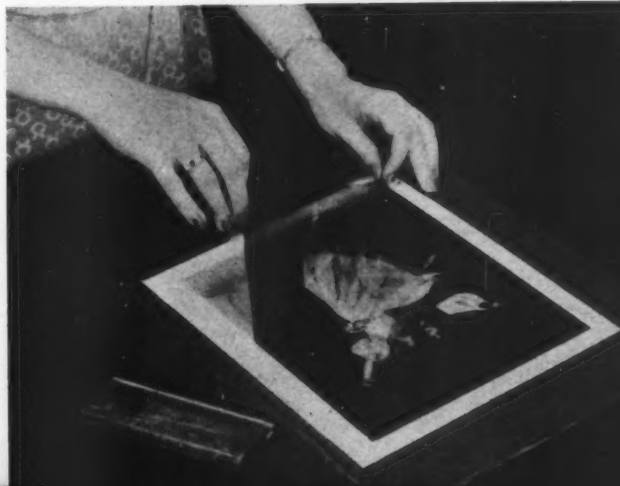
The yellow image, after thorough washing, is immersed for about two minutes in the Yellow Toner B, and then washed in running water for about twenty minutes. It is then ready for assembling.

Assembling

The third step in making color prints by the Chromatone Process is assembling the finished photograph. Many people anticipate there will be difficulty in registering the three thin films. However, this doubt is at once dispelled after the first print is assembled, so easy is the process.

A piece of gelatine coated paper (Chroma-

Mounting The Assembled Print



tone Backing Paper) previously soaked thoroughly in water is laid, gelatine side up, on a clean ferrotype tin, clean glass, Masonite tempered hard board, or on any flat waterproof surface. The yellow image is placed first on the paper and squeegeed firmly into place, emulsion side down, and allowed to remain for a few minutes. The red image is then placed on top of the yellow, pushed carefully into register, squeegeed lightly, the register checked, adjusted if necessary, and the red image squeegeed firmly into place. If at this point the two images do not appear exactly in register, the red sheet may be peeled off carefully, re-moistened, and registered again. It will be found easier to register the red and yellow images if they are viewed through a light blue filter.

The blue image is then superimposed upon the other two, precisely as described above, completing the color print; all prints emulsion side down.

If mounted collodion side up, the finished print has a high gloss. The collodion acts as a natural protective layer but the finished prints are not easy to retouch. Chromatone Stripfilm has a reasonably tough emulsion surface and with moderate care prints can be assembled emulsion side up. This has definite advantages, to be explained later.

Drying the Finished Print

The print is now allowed to remain in the air for about ten minutes until the surface dries to some extent. Next, the damp print is trimmed so that the edges of the collodion layers are flush, and placed on a piece of rigid, hard, waterproof material. Masonite Tempered Hard Board is admirably suited for the purpose.

Ordinary Kraft gummed tape is moistened and the damp print fastened to the board with this tape overlapping the print about $\frac{3}{16}$ " on all four edges. Do not have the tape too wet or the gum will ooze between the print and the board, making it difficult to remove the print.

The print will dry rapidly, stretched absolutely flat. It can be loosened from the board when dry by carefully inserting a sharp knife through the tape under the edge of the print and running it around the print.

Varying the Surface Effect

The beginner should first assemble his prints collodion side up. A little more care is needed to assemble gelatine side up but prints so assembled are much easier to spot and retouch, using transparent water colors or dyes.

A matt finish can be obtained by spraying the dry paint with matt lacquer by means of an air brush.

A rough surface paper can be used for assembling. A recent variation of the technique is to remove the collodion layer by means of Acetone as the prints are assembled. This method gives superlative whites, prints dry absolutely flat, and can be assembled on such rough surfaces as canvas. The process is quite easy and full details will be given by the Service Department of the Defender Photo Supply Company at Rochester, N. Y.

Darkroom Shortcuts

Prepared developing and fixing solutions have removed most of the drudgery from darkroom work. They permit the city apartment dweller to develop his own with success equal to the more fortunate worker who has a complete darkroom at his disposal. What is more, these prepared solutions are compounded with the greatest care and accuracy. Armed with one of the small miniature tanks and a bottle each of fine grain developer and fixer, the amateur cameraman is all set to turn out a fine job of developing in his kitchen or bathroom. These prepared solutions assure standard results, free from the variations of haphazard mixing.

Shooting in Sequence

Many readers have commented on Mr. Frederick C. Daniel's fine article in last month's MINICAM on "The Fourth Dimension in Photography." Although sequence pictures embodying a degree of the time element are not altogether new, the Robot camera, especially designed for this type of work has made photographers series-conscious as never before. Among modern miniature cameras the compact Robot now takes a definite place with the machine gun precision of its rapid fire shooting. This camera, as well as others embodying quick repeat devices, will bring about a marked change in miniature camera technique of the future.

AM

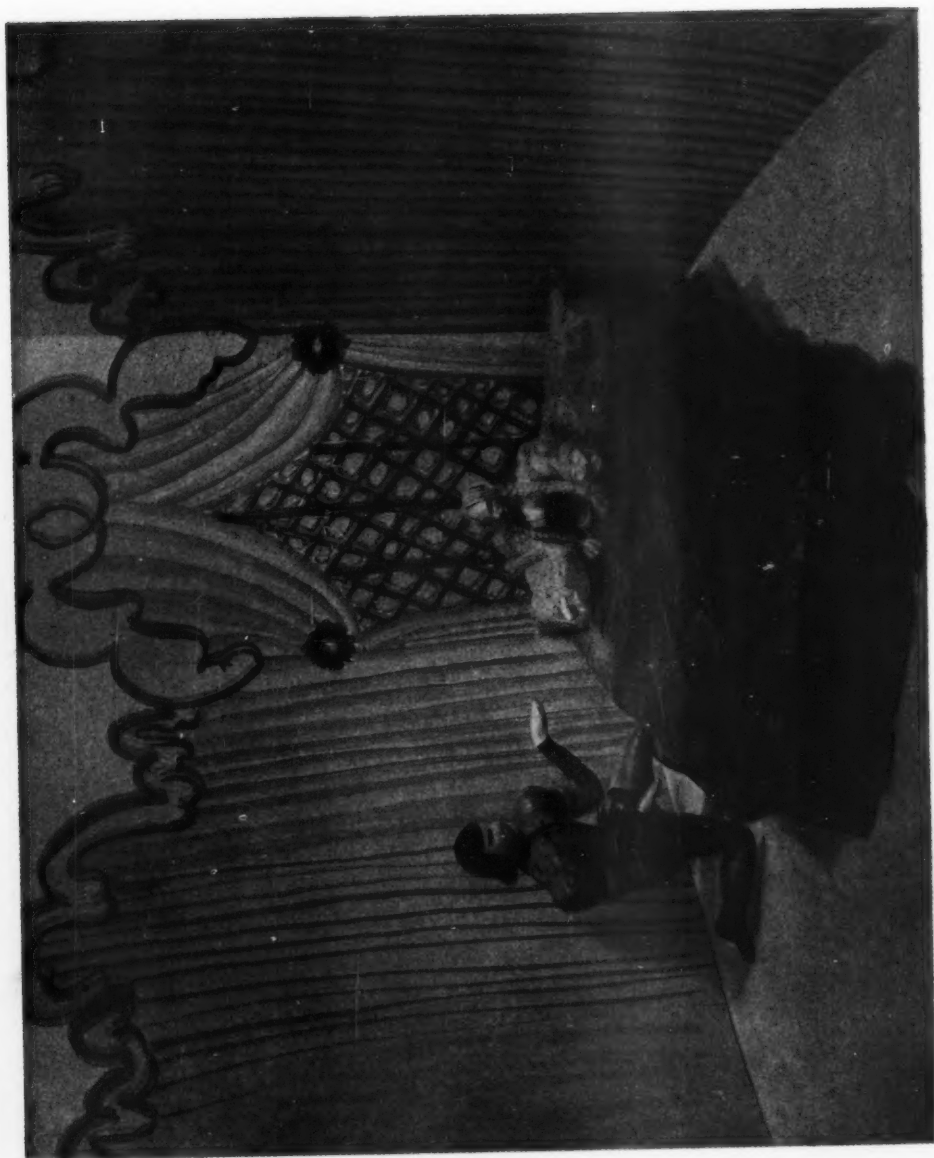
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How to Illustrate

YOUR FAVORITE BOOK

By Evelyn Baird

Making photographic book illustrations is the newest minicam pastime combining fun and profit. Make your favorite fiction characters come to life in color and black and white! Without special equipment, and at trifling cost, you can create individual and striking gifts by means of this new camera magic.

WANT to do something unique with your miniature camera? Then make photographic illustrations for your favorite book or story. Not until you give the idea a few minutes serious consideration will you realize its practically unlimited possibilities of amusement and genuine worth.

On your bookshelf there is one volume or story that you cherish above all others. It may be "*Vanity Fair*" or "*Alice In Wonderland*" or your child's book of fairy tales.

A set of illustrations for this favorite text, planned, devised, staged and photographed by your own hands will permit you to share intimately with the author the thrill of creation. Nothing can quite equal watching a favorite old "character" friend come to life through the medium of a bit of plaster, a piece of twisted wire and a few scraps of old cloth.

From a more practical point of view, your finished illustrations will have a genuine value. Together with the book illustrated, a portfolio of half a dozen photographic "interpretations" make a gift anybody is proud to receive. If you are more commercially

minded, you will find that your own set of pictures displayed, will bring you orders for many more.

You do not need to be an artist or sculptor to make photographic illustrations that will be little masterpieces of their kind. If you are dextrous with your fingers, it will help, of course, but a little ingenuity will go a long way toward making up for any lack of artistic talents. There is no point or value in attempting elaborate pictures that are posed professional models. That sort of thing went out in book illustration along about 1890. The chief charm in your work will lie in the interpretive quality you bring to your pictures and your ability to suggest happenings without portraying them too literally. You can get away with an awful lot of murder on that ground.

As in all things, there are a few tricks and dodges in this work that make all the difference between first rate craftsmanship and just plain mediocrity. First, you must be thoroughly familiar with the book or story you are illustrating. You should analyze it the way a movie director would his scenario.



Fig. 1. The witch stands over the infant princess's cradle. The figures were made of plastic clay as explained in the texts

Every story has its high spots and its weaker ones, moments of dramatic interest and those when nothing much goes on. You should select for illustration those passages which not only have strong appeal but which also lend themselves to photographic treatment. Thus, two seated people holding a conversation may possibly be a pivotal factor in the story but hardly constitute a powerful picture. Finally, on this phase of the matter, avoid scenes that demand too many characters, not only because their making represents labor, but because a crowded scene tends to look cluttered and confused.

A good illustration conveys only one idea or depicts only a single incident. In this respect, photographic illustration has much in

common with advertising technique. Say one thing at a time and say it plainly and as convincingly as possible.

I have said that your pictures should not be too literal. Actually, you can go almost as far as you like in the direction of the fanciful. If you don't want to bother preparing figures, you can haunt the dime stores and acquire a remarkable collection of tiny dolls and decorative knick-knacks that a few deft touches will transform into any character you choose.

To my mind, a good part of the fun in making photographic illustrations is preparing the models. I like to model figures from plasteline, but that is purely a matter of choice. You can make your figures out of



The Sleeping Beauty

Fig. 2.

twisted pipe cleaners (they make beauties) or dressed up sticks, "boughten" figurines—even vegetables carved into appropriate shapes. The only limits of your material are the limits of your imagination.

I happen to be partial to fairy tales. I decided to illustrate "*The Sleeping Beauty*" by Hans Christian Anderson because its story lends itself to gay and colorful pictures, the number of characters is conveniently few—and because it has always been one of my favorites. Having determined the scenes I intended to portray, I then set about getting the necessary materials for my models. They are as follows, obtainable at any art supply store at a trifling cost:

- 2 rolls soft copper wire
- 1 pair pliers
- 4 lbs. plasteline
- 1 modeling tool
- 1 pair scissors
- 5 large sheets cardboard
- 1 set opaque water colors
- 2 ozs. shellac
- 1 paper of pins
- 1 roll of gum tape
- 1 skein of yarn for wigs
- 1 single edge razor blade
- Needle and thread
- Material for costumes
- Brushes

Plasteline figures are not flexible, so decide in advance the exact pose of your various



The Spinning Wheel

Fig. 3.

models. This determined, the first step is to make a skeleton figure about eight inches high out of copper wire. Use the pliers to bend and twist the wire to the approximate outline of the figure, then tack or nail the skeleton to a board so that you have a firm armature to work on.

You are now ready to apply the clay. The figure is modeled on the skeleton, the clay applied, a small quantity at a time. The modeling tool is used to define the features, hands, feet, etc. If you don't want to invest in a small modeling tool, you can make a quite serviceable one out of wire, a hairpin or even a lollypop stick.

The point to remember is that the figures should be kept simple. If your ladies are wearing long skirts, there is no need to model legs or feet since the skirt would hide them in any case. Bear in mind that you are striving for a general effect, not intricate anatomical modeling.

When the figures are finished, they are given a coat of white shellac to prepare them for painting. After the shellac has dried, give the entire figure a base coat of white, opaque water color. While you are waiting for this to dry, mix a flesh tone (brown, yellow and white). Make sure that the base coat has dried, then paint the flesh tone on the head,

hands and whatever skin shows. The eyes, lips, mouth and cheeks should be suggested with a touch of color.

If the clothing has been modeled on the figure, as in the case of the prince, this should now be painted an appropriate color. A contrasting color suggests the collars, cuffs and buttons. Wigs are made by tinting bits of white yarn. The yarn is fluffed up and either tucked under hats or attached with a touch of shellac in the case of braids, etc. Now the costumes for the fabric-clad characters are cut and sewed where necessary. The gowns are held in place with pins embedded right in the plasteline, which avoids much gluing and sewing.

PREPARING the costumes is one of the easiest and most interesting phases of the job. If you fancy yourself as something of a designer, you can give your imagination free rein. Or if you want to duplicate the costumes of some period, you will find in your local library any number of reference books on costuming, showing colored plates of the various periods. On the other hand, if you're one of those members of the sterner sex who considers such work incompatible with your dignity, any one of your girl friends will think you are doing her a favor if you permit her to design and execute your costumes. With most girls, it's a hangover from the playing-with-dolls stage that they simply can't resist.

The "props" and the set may be as simple or as elaborate as you please. For *"The Sleeping Beauty"* the spindle, the chair, the cradle, etc., were

modeled, shellaced and painted. Others, like the bed, were cut out of cardboard. Before constructing the actual set, it helps to consult illustrated books, postcards or other sources of ideas. When you know fairly well what you want, outline with a hard pencil on the cardboard the various sections of the set. Keep in mind the scale of your figures, in relation to doors, windows, furniture, etc.

Use the razor blade to cut out each section and reinforce all folded edges and joinings with the gummed tape. A neutral floor is best and this can be a sheet of colored paper or plain cardboard. If you feel ambitious, you can achieve a better effect by applying thickness to arches and windows where they are visible. You can even model pillars from plasteline to heighten the effect.

As with the figures, which may be bought inexpensively, you can avoid the whole problem of a set by purchasing in any toy depart-

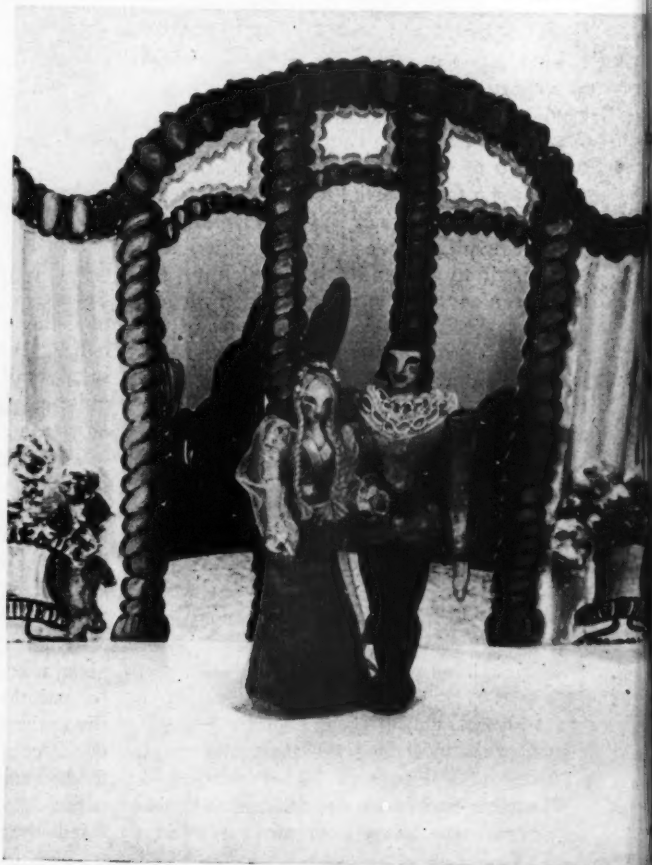


Fig. 4. *The Happy Ending.*
The background is cardboard,
the pillars painted in with
water color.



Fig. 5. Showing the actual "set" for the Spinning Wheel. Since only two walls are shown, a complete set is unnecessary.

ment one of those miniature cardboard theaters which are such favorites with children. They cost very little and can be readily adapted to your needs.

When everything is ready to be photographed, the time for real ingenuity arrives. It is in the lighting that the real mood of the story is set. For dramatic effect, a single spot will do wonders. You can vary lighting all the way from a flat, all-over illumination to sunlight effects, back lighting, etc. In Fig. 5 is shown the completed set for the Spinning Wheel. Two lights were used. In general, however, it is advisable to keep your lighting as uncomplicated as possible. A neutral viewing filter will help you immensely in determining how your finished picture will look.

If you will compare the color picture on page 70 with the black and white illustrations, you will have proof of what you undoubtedly already guessed—that color makes all the difference in the world. Naturally, you want color prints and these can be had in several ways.

You can take natural color shots in Dufaycolor and have prints made directly by the company. You can use Kodachrome and make your own color prints by one of the color processes. There is a third way: Hand-coloring black and white prints.

IN this work you are drawing on your imagination at every step. What is more natural, therefore, than to finish off the un-

dertaking with delicate water color tinting? If you feel the necessity for some color guide, I suggest that you shoot on Dufaycolor or Kodachrome parallel with your black and whites or even make your monochrome enlargements directly from color transparencies by means of copy negatives. Either way, the transparencies will serve as a comparison check on your hand-coloring. Be careful, however, not to make your black and white prints too dark or they will not take color well.

There remains now only the matter of presentation. Prints may be mounted on a lightweight board, about 11x14 and put into one of those decorative boxes all stationers sell. In that case, it is a nice touch to make a duplicate of one print and paste it on the front of the box with rubber cement. Waxing or a coat of clear varnish will help preserve it.

Then you can dry mount the picture and have a local binder make them up into a slim, wire-bound volume.

Other ideas will come to you as you go along. You will find yourself collecting odd bits of junk for "props", pieces of pictures that will serve as "backdrops" and what-not. But it's prime fun, just the same, with the added satisfaction of knowing you are doing something which, when finished, will have a very real value.

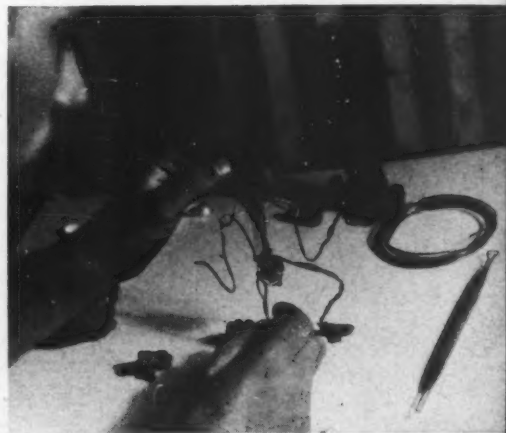


Fig. 6. Making the figures. A wire framework is used as a basis and the clay molded over this.

How to Make

PHOTO MURALS

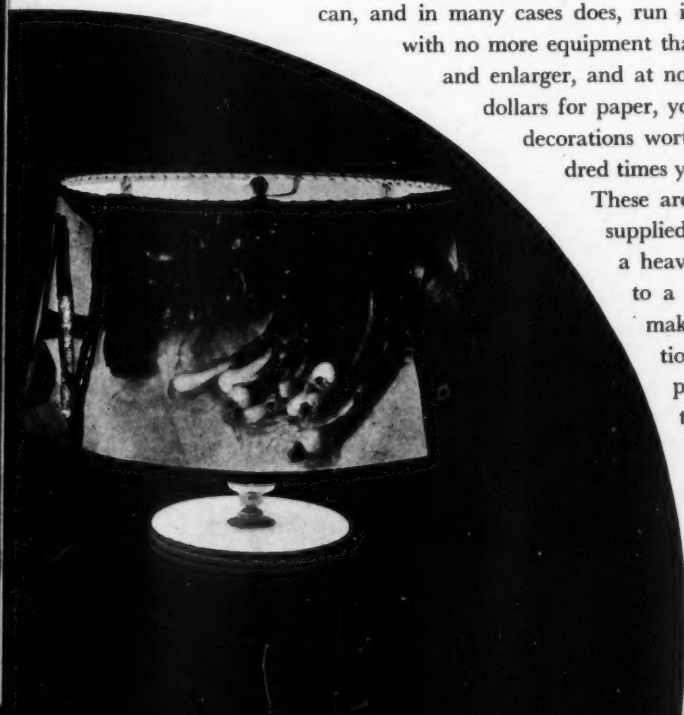
and DECORATIONS

Not so long ago the possession of a photo mural was a sign of its owner's wealth. Today it is available to every miniature camera owner. You can make not only wall murals, but photo screens, lamp shades and other types of decoration that will enrich and beautify your home. The cost is low, the technique simple. MINICAM presents, complete in this issue, ideas and illustrations for a great variety of photo decorations as well as detailed, step-by-step instruction for every stage of the work.

WHAT else imparts such distinction to a home, or individuality to a room, as a photo mural? In professional decoration, whether it be public building, penthouse studio or country home, photo murals figure prominently — and expensively. A single wall panel can, and in many cases does, run into hundreds of dollars. Yet, with no more equipment than your own miniature camera and enlarger, and at no more cost than three or four dollars for paper, you can make murals and other decorations worth as much as fifty to a hundred times your cash outlay.

These are not idle figures. The mural supplied by a decorator must absorb a heavy cost for negatives, payment to a studio for the time spent on making the large print, installation and the decorator's own profit. Add to this the fact that murals are the last word in swanky decoration and you will begin to realize that the

Fig. 1. Photographic transparencies make lamp shades that are different. Pictures of fruit and vegetables have been combined in this unusual design as explained in the accompanying text.



A Book Length Feature Complete in This Issue

big picture you can make in a single evening is worth enormously more than your actual cash outlay. Here is one field of photography where every dollar spent on material represents a finished value of a conservative fifty dollars.

Photo mural is a generic term which most people associate with huge wall pictures. MINICAM proposes a more elastic definition, namely, the photo mural as any decorative application of photography. That includes not only pictures for entire walls or sections of walls, but fireplace decorations, window valances, table tops, screens, lamp shades, waste paper baskets and, in fact, any surface which needs the ornamentation of decoration. It is in this broader sense that the present work has been written.

This text is addressed to the amateur working in his own home with fairly limited space at his disposal and only average dark-room equipment.

The Wall Mural

The proportions of a wall mural will be determined by the nature of no consequence in themselves, but are important only as they adapt to the decorative scheme. Thus, the wall mural is equally effective horizontal or vertical, narrow or wide. Good advice is not to let your enthusiasm run away with you in the matter of size. If the room is fairly small, restrict the mural to a proportionate size so that it does not have an overpowering effect. (See Fig. 5.).

The same general advice holds good for subject matter. A mural can make a small

Fig. 2. Photo mural in the dining room in the home of Alexander W. Dreyfoos, the smaller panels continue the principal motif. Photo Mural by Apeda Studio, Inc.



room look bigger or a big one smaller, depending on the wisdom exercised in the choice of pictures for enlargement. Heavy subjects such as interior scenes, tall buildings, closely woven floral patterns, machines, etc., tend to pull a room together and cut down size. It follows that contrasting scenes, such as wide vistas, views across a lake toward distant mountains, ocean and pastoral scenes, will give a sense of spaciousness.

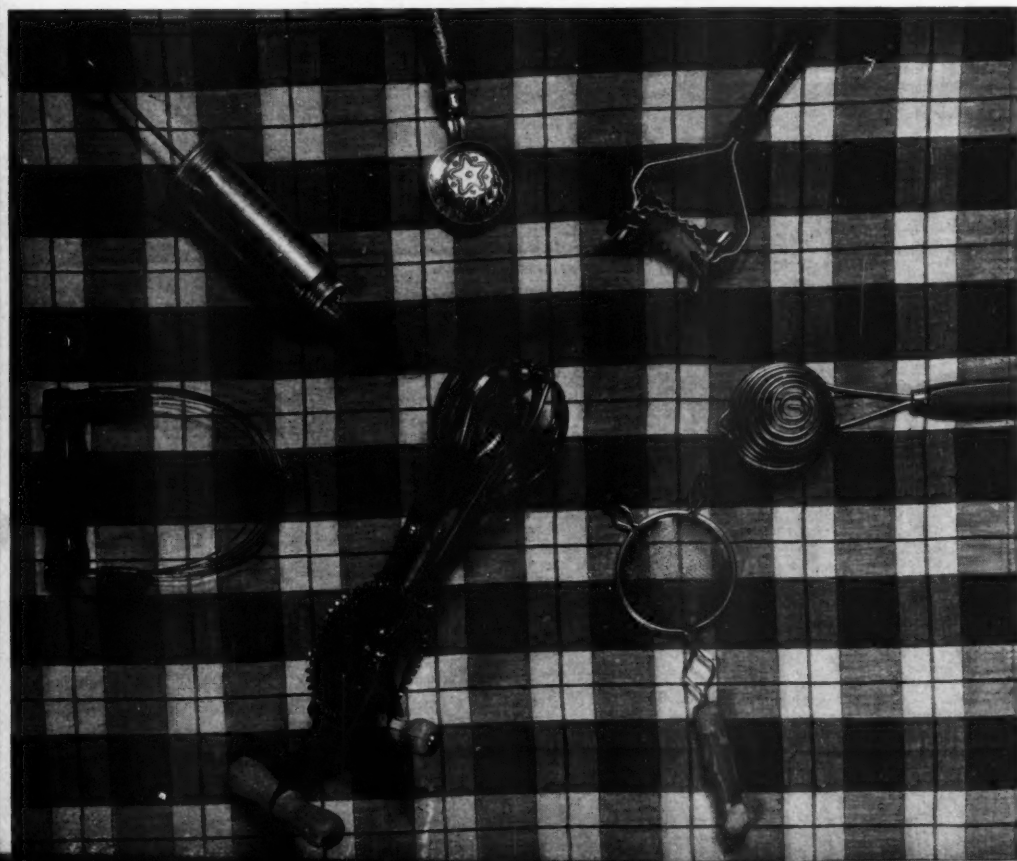
A mural, to achieve its desired effect, must be viewed at a reasonable distance so that the eye can take in the whole scene or the greater part of it. This last is an important factor in determining its proper location and size. An impressive picture in a narrow foyer where only a few square inches can be seen at a time, is an obvious waste. On the other hand, a small picture on a large expanse of wall across a long room will seem dwarfed. (See Fig. 2).

Whatever the result desired, the mural should be thoroughly planned in advance and thereafter executed according to a pre-arranged schedule. If you want an approximation of what the effect will be, it sometimes helps to tack up large sheets of newspaper in the space that will be occupied by the mural. While this will, of course, be no guide as to the wisdom or lack of it in your choice of subject matter, it does serve to give you an idea of the mass effect. If the "feel" is overpowering, try cutting down the area or consider a better location. Stand well back from the wall and test whether your eye is able to take in the entire newspaper-covered space or a considerable portion of it. Now, rather than after the mural is finished, is the time to do your juggling and experimenting.

The Enlarger In Mural Work

Most miniature enlargers are able to pro-

Fig. 3. Design for kitchen mural. The background is a checkered tablecloth. In repeated design murals it is important not to crown the picture with too many objects.



duce prints large enough for murals, either by the familiar method of turning the housing around on the supporting arm and making the enlargement on the floor or by adjusting the housing in a horizontal position and projecting the image on an improvised wall easel. The problem is not how to get an image big enough, but rather how to keep the enlarger from vibrating during the long exposure time.

Clamping the enlarger baseboard to a solid table and further weighting it down with books, etc., helps. In a city apartment, with heavy trucks passing outside, the most sensible procedure is to delay enlarging until fairly late in the evening when traffic has slowed down.

A regular projection lantern, if available, equipped with your camera lens will do the job of enlarging in a fraction of the time required by your enlarger and will eliminate the hazard of vibration. By using the lantern, exposures as short as ten or fifteen seconds are enough.

Lacking a projection lantern, your regular enlargement will have to do. Don't move about or permit anyone else to do so during the projection time. Make sure the enlarger is solidly supported and then keep your hands off it. A set of rubber casters of the sort you can buy in any Five-and-Ten, placed under the table legs, will cut down vibration amazingly.

Projecting the Mural

The ordinary thin negative will seldom stand considerable blowup. Striving for contrast in the final print under the usual conditions will cause loss of all quality — and in this work quality is essential. It is therefore necessary to have a negative with somewhat

Minicam's \$175 Prize Contest

Contest has been extended to close October 20th, 1937.

Can you take an idea and express it fully and completely within a single picture, with so much force that every person will unmistakably understand your intent? And, can you give the picture originality of presentation?

Here is the "assignment" for which MINICAM will pay \$175.00 in prizes: Your theme is HAPPINESS. Your job is to convey, *within one picture*, that sense of complete joy and contentment we commonly identify as "happiness". You are free to carry out the assignment in any way your own mind dictates. You may even make an abstraction without a human subject. There are as many possible interpretations as people who tackle the assignment.

For the best picture titled "Happiness" MINICAM will pay \$100 in cash. A second prize of \$50 and a third prize of \$25 will be awarded for the second and third best pictures submitted. In addition, fifty merit blue ribbons will be awarded to the fifty best pictures submitted.

RULES

- All contestants must abide by the following simple rules.*
1. All pictures must be made with miniature cameras whose film size is not over $2\frac{1}{2} \times 3\frac{1}{2}$ inches.
2. Pictures must be submitted as glossy prints on paper not smaller than 5×7 inches nor larger than 8×10 inches. It is not necessary to mount prints or to make elaborate presentations.
3. If human subjects are used, a statement of release for publication signed by the model must accompany each picture.
4. You may submit as many pictures as you wish provided each is complete in itself and is on the subject "Happiness".
5. It is not necessary for you to do your own developing and enlarging.
6. All submissions must be sent to Contest Editor, MINICAM, 381 Fourth Avenue, New York City.
7. If prints are to be returned, a return stamped envelope with sufficient postage must be included at the time of submission. MINICAM cannot assume responsibility for pictures lost.
8. The sole judges shall be the editors of MINICAM whose decision shall be accepted as final.
9. Prize winning prints shall become the exclusive property of MINICAM. Contest has been extended to close October 20, 1937.

more than medium contrast. Remember, you can't get more out of a negative than there is in it. A fine shot, but thin, is better passed up.

Having decided on your picture, make a blowup of about 16×20 inches and study the composition on this. In a big blowup, details which you might easily overlook in an 8×10 become visible. Don't be frugal with this preliminary enlargement at the possible risk of ruining your final print. Now determine the cropping lines for the best possible composition to conform with the space in which the picture is to be displayed.

You have, at this point, a choice of two procedures. You may either elect to make the enlargement out of a single sheet of paper, or you may enlarge in sections and later join them together. Each method has its advantages and its special problems.

Photographic enlarging paper is available

in rolls up to forty-two inches wide and ten or more feet long. If you choose to enlarge in a single sheet, assuming that the width of your picture is not greater than the roll size, you are spared the necessity of matching up your exposures for uniform color or of piecing together the final print. Against these advantages, you must weigh the risk of developing and handling a print several feet long.

Whichever method you decide upon, the next step is to project the full picture, to the final size determined upon, on your wall or floor "easel". The proper size and area may be outlined with black cords which will not deface your working surface. For convenience, we will assume you are working on a wall.

When the image has been focused and composed for size and area, the test exposure is made. To do this, pin up a sheet of 8 x 10 paper of the same variety and grade as will be used for the large shot. Make an exposure at a guess and develop it. You will probably find you have grossly under-exposed. Continue your tests until you are fully satisfied, which will probably be in about four tries.

You are now ready for the final exposure or series of exposures, depending on whether you intend to make single sheet or sectional enlargement. Incidentally, don't fool with your exposure time once you have determined it. Resist that temptation to play a hunch and give it a little more or less. Your tests should be conclusive or something which a pot shot won't fix, is wrong.

Handling the Single Print Mural

Let us consider, first, the problem of handling the larger size print. It is assumed that you would not in any case try to make a single shot larger than forty-two (the width of the paper) by about sixty

inches. Having finished your tests, leave the enlarging light on, put a red filter over the lens and pin up the sensitive paper so that the image is just right. Remove the filter and give the exposure determined upon.

To develop such a picture, you need a "tray" at least 48 x 72 inches, or four by six feet. If you are ambitious you can build such trays, using $\frac{3}{8}$ " plywood for the bottom, and somewhat wider boards of white pine 4" high for the sides. Seal the inside seams with melted paraffin or mending wood and then paint over the entire tray with two or three coatings of Kodacoat or Probuss paint, applying this acid-proof coating particularly generous along the seams and in the corners. An additional coat on the inside of the tray won't do any harm.

A cheaper and just as effective way of building your tray, if you exercise reasonable care, is to have merely the outside wood frame made. To this, tack a sheet of double-faced corrugated board. The whole is then well painted with three coats of melted par-



Fig. 5. An exceptionally fine use of a photo mural above a fireplace.

Photograph by Von Miklos. Photo mural by Apeda Studio, Inc.

affin. On this framework is laid a piece of oilcloth about 60 x 80 inches and the edges of the material are tacked to the edges of the wooden frame. The oilcloth is allowed to sag to the bottom of the tray. The paraffin-cardboard is merely to prevent staining of the floor if a few drops should leak out of the oilcloth.

A made-to-order tray of the proper size is the family bathtub, but it is only fair to warn you that many developers are apt to leave a permanent stain on the porcelain. The home-built tray is somewhat more trouble but a lot safer. It won't hurt, either, to spread a goodly layer of newspa-



Fig. 6. One method of joining transparencies using scotch tape for binding. The tape is folded over the top then run down the sides.

pers under the tray, just in case. One such tray is enough, as we shall see.

The tray is set upon a perfectly smooth floor, cement or linoleum preferably. Development is not by the usual method of immersion which, with so large a print, could not be trusted to act evenly enough. Instead, the various solutions are applied with cotton mops, about half of a quarter-pound roll of cotton being used for each mop. Two mops should be used simultaneously, so that developing is really a two-man job.

Exposure of the print should be such that developing is completed right on the dot of one and a half minutes. Forcing development is bound to stain the print. During development, of course, whatever room you happen to be working in must be carefully shielded against white light. Be very careful about this. You're going to feel awfully bad if an otherwise fine job is ruined because the paper got fogged. Make sure that all windows are carefully shielded, chinks of light under doors plugged. And be sure that your safelight is really safe, by actual test. Many are not.

All these minor but nonetheless important details attended to, spread the paper out in the "tray" which, at this stage, is perfectly dry. Pour a gallon of cold water over the paper and make sure that, if you are using the oilcloth tray, there are no wrinkles in the material under the paper which might cause cracking. Spread the water about and dampen the paper thoroughly, after which remove the excess water with the cotton. This procedure will serve to make the paper limp and will facilitate handling.

When most of the water is up, pour on half a gallon of developer and spread it about over the paper as evenly as possible. Now start the mops moving. The purpose of the mops, as is now apparent, is to keep the solution changing and the paper covered. You can't prevent a few streaks from appearing, but if your timing is good, they will develop up to an even tone.

Keep the mops moving until the end of the development time. At about one and a quarter minutes, start removing the developer with the cotton mops. When the bulk of it is gone, pour on a gallon of five percent acetic acid. Don't bother with trying to get up all the developer at the risk of prolonging development. This is the ticklish stage of the task. The acetic acid acts as a powerful short stop and is one of the essential points in making big murals because it stops development in a few seconds and thus enables you to keep development uniform.

If you attempt to apply hypo to the print immediately after removing the developer, you are almost bound to get stains. For that reason, the use of a short stop somewhat

stronger than the usual stop bath which takes up to a minute to act, is absolutely essential.

After the short stop has been washed over the print for five minutes, it is mopped up and the hypo applied. This is mopped about for fully ten minutes. The print is next very carefully rolled up and, with the end of the roll held over a pail or basin to catch the drip, the whole is carried to the bathroom where the tub has already been filled with cold water.

At this stage of the game it is perfectly safe to use the bathtub. Place the print in the water and unfold it. After rinsing the sheet two or three times, open the drain and let about two-thirds of the water out. Refill the tub and rinse the sheet up and down again for about two minutes. Now drain the tub completely and refill. Rinse the sheet and this time allow it to rest in loose folds for five minutes.

The tub must be emptied and refilled every five minutes for an hour, rinsing the sheet three or four times at the beginning and end of each filling. Be careful to keep the sheet away from the water faucet, lest the impact of the water cause cracks or wrinkles in the paper.

When the print has been washed, hang the sheet from a wire or cord strung across the room. Newspapers should be placed on the floor to catch the drip, while film clips, hung to the lower edge, will prevent the paper from curling.

Handling the Sectional Mural

If the job of handling a large print seems appalling, making the enlargement in sections is not as difficult as it would appear. In any event, if you are planning a mural wider than forty-two inches, you would be compelled to use the sectional enlargement technique. The easier way to make a sectional enlargement is to pin up alongside each other as many sheets of sensitized paper



Fig. 7. An interesting variation with photo lampshades is the use of alternate upper and lower borders of ordinary black paper. A lamp shade of zoo pictures fits admirably into a child's room or game room.

as will be required for the complete enlargement. Use standard size sheets, not smaller than 16 x 20 inches, or you will have far too much piecing to be done. Make sure that the sheets are overlapped about an inch to prevent breaks in the picture.

If you cannot manage enough open wall or floor space to expose the various sections simultaneously, the job is made considerably more difficult, though by no means impossible. In that case, tack up a single sheet, expose it, and put it carefully away where light cannot get at it. Then move the enlarger so that another section of the picture comes into view, taking care that the enlarger is not moved closer to or further from the easel.

Do not change the angle of the enlarger by tilting the housing, but move the entire machine, table and all. Changing the angle will make it impossible later to match up the sections.

In all sectional enlarging, try to plan the breaks from one sheet to another in such a way that some natural break in the picture, like a wall or other line comes at the joining joints. Be careful, also, not to vary exposure time, otherwise your finished print will have a variety of tones.

Development proceeds as with any print. Do not try to develop the various sections at

(Page 88, please)



Studio Deutch

(Continued from page 27)

WHAT has Heyworth Campbell to say to the amateur? This, and it is an important message. The secret of successful photography is simplicity. A good picture is like a simple declarative sentence. It has one thing to say, says it, and that is all. There should be one object, one motivating force or idea. Everything else in the picture must be subordinated or eliminated.

Good photography, continues Heyworth, has dignity. If it is glad, it is joyous; if sad, it is tragic. It never resorts to cuteness, pathos or the sniggering varieties of humor. Watching Heyworth at work, I have repeatedly seen him reject otherwise good pictures because they were cramped and crabbed. He wants a picture to have a sense of space, room in which to breathe and expand.

Finally, he is ruthlessly adept with scissors. Time and again, I have seen him take what appeared to be an indifferent shot and convert it into a breathlessly exciting subject by no other device than cropping and reframing. He says:

"Look at each picture you make upside down and from all sides. Cover it with pieces of white paper, move them about, don't be afraid of destroying your shot. Nine times out of ten you'll find that concealed somewhere within your frame, perhaps in only a tiny fraction of it, is a picture infinitely better than your original."

HEWORTH CAMPBELL'S philosophy of good art could be profitably adopted by every amateur worker seeking self-expression via the nude. Clothing emphasizes sex. If you don't believe it, try a little experiment.

Pose a nude figure in a sitting pose, knees crossed, the line of the free hanging leg a continuation of the upper body line. With good conventional lighting you will get an average good picture showing one type of line and mass.

Now, with a retouching pencil or black ink paint in a pair of stockings on one of the prints. Or, if you are more ambitious, pose the model again in a pair of black, sheer silk stockings. Holding the two pictures side by side you will be amazed at the quality of suggestiveness created by nothing more than that elementary bit of clothing.

But a successful nude study must be something more than a picture of a girl waiting for somebody to click the shutter so that she can put her clothes back on. It must have composition, which is to say an arrangement of line and mass uniting to form a pleasing pattern.

When posing the model, study the pattern of line and its continuity. There are several points for which to watch. For example, beware of the "bad break", the abrupt elbow jutting out at a funny angle, or one shoulder

*Leed Burger*

held awkwardly high. Be sure the model is not sitting so heavily as to produce a lumpish effect. For most compositions she should be poised lightly, as though passing from one motion to another, rather than quiescent.

Appraise your model to capitalize on her good points while minimizing the poor ones. Here the virtue of cropping becomes apparent. The instances are legion of good pictures having been secured by taking parts of complete studies that in their entirety were indifferent or even bad.

There is seldom opportunity to do much more than general posing at the time the pic-

ture is being taken. The final composition is done on the enlarging easel or by cropping a test print. Sometimes a head is lopped off, again only a shoulder is shown. Brilliant effects can frequently be achieved by turning the enlarging easel and printing the picture at a slant, so that a reclining figure appears poised for flight.

In this connection it is worth mentioning that often it is advisable to put a picture aside and go back to it after a period of time. You will be surprised to discover how many really excellent shots you had in what you thought were your discards.

THE matter of "key" is of great importance in nude studies. A picture in which the general effect is of darkness, heavy masses, relieved by only a few highlights is said to be in low key. On the other hand a picture containing modulations of light tones, no heavy solids and few dark spots is said to be in high key. It must not be supposed, however, that key is determined merely by printing a picture lighter or darker.

The difference is that the low key starts at a lower point and works downward. You can visualize this better by thinking of a piano keyboard. On it there are many octaves. You can play the scale at the upper end of the board and get high tones or you can play it further down and get deep ones. In each case, however, you have played the full scales. Similarly with high and low key pictures.

Key is determined largely at the time the exposure is being made. If you are seeking high key you will light more brilliantly and expose on the short side, being careful, however, not to underexpose. A low key picture will have dimmer lighting, less evenly applied, and the exposure will be as full as possible.

The choice of key is determined by your subject matter. Obviously you will not depict a gay, laughing blonde in low key or a brooding Spanish type in delicate high key. Low key pictures adapt well to models with dark hair and features, heavy bodies and poses illustrating strain or emotional stress.

High key should be used with girlish models, fair complexioned, possessed of slender limbs. The mood should be joyous in keeping with the key. Avoid showing heavy objects in the scene and avoid, too, as much of the stage setting as possible. Contrasty or one-sided lighting should, of course, not be used.

Finally, the effectiveness of the nude study will depend on your theme, or thesis, what you are trying to say or show. Try to work out your idea in advance, making rough pencil sketches of what you intend to depict. You need not follow them too slavishly, but they serve, at least, as a point of departure. Avoid "faking", that is trying for melodramatic effects which, in your heart, you know

are false. Follow the dictates of your own sense of good taste you will never go far wrong.

Secrets of Photographic Make-Up

(Continued from page 17)

make-up while to achieve prominences, we use white.

We apply the ground color as usual and then ask Pat to draw in her cheeks. This done, we apply the gray as a spot in the deepest depression of her cheek and blend it outward with the ground color. We have to watch these three points:

1. Use barely enough gray color to be distinctly perceptible.
2. Blend into the ground until there is no suggestion of a line between gray and ground.
3. Avoid crossing the line of either cheek or jawbones.

Now we want to narrow her nose to conform. Easy. The trick is turned with a line drawn down the middle of each side of her nose, about three-quarters of an inch long. The brown eyebrow pencil is used. The camel's hair brush will help us spread the lines a bit and blend them carefully into the ground. The result is that the ridge of the nose is light and the sloping sides shaded.

With this make-up we want to use a hair-dress that will further emphasize the length of the face so we can either pile the hair high on her head or pull it well behind the ears. Pat must now be photographed at a slight angle or full face — never at such an angle that the blotch of gray "shadow" is broadside to the camera. We can further heighten the effect by touching the ridge of her nose and the prominences of her cheek bones with white paint which is then blended right down into the ground color. Our end result is Fig. 8.

The converse effect may be seen in Fig. 7. Here Pat's face was made broader by using a dark ground and blending white into her cheeks over the cheek bones in about the position rouge would normally occupy. The hair was dressed to emphasize width and the eyelid "tails" were pulled out slightly longer than usual.

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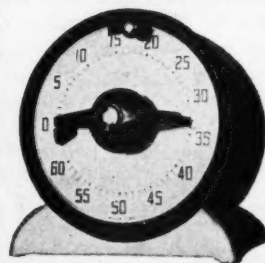
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effective and, while it may not seem so, is one of the most difficult tricks in make-up. First the length of the natural brow line to be retained must be determined and the rest carefully filled with white grease paint. This is wiped down and the ground brushed over it and, in turn, this must be blended into the rest of the facial ground. The problem is to prevent any hair showing through the covering, a difficult feat if the subject has dark eyebrows.

When the natural outline has been obliterated, the new line is drawn in with the eyebrow pencil. The proper relationship between lash and brow formation must be observed.

The Oriental Effect

FOR an oriental appearance it is unnecessary to use collodion to pull the corners of the eyes upward or to use any other possibly dangerous device. The same effect can be achieved by changing the brow line and leading it upward. The upper lid is heavily lined, with the fold of the lid blended into the remainder and the "tail" of the lash line also led upward. The space immediately beneath the brow is whitened and this blended into the shadow paint used on the lower portion of the upper lid. This effectively suggests the oriental eye character. The lid make-up should be narrow and round and the hair dressed high.

Just to prove it could be done, Pat sat for one of those old woman shots. Here, briefly, is how it was worked out. After the ground, the wrinkles were penciled in, following the natural lines of the face and forehead. The furrows running from the corners of the nose to the mouth were similarly outlined so that when she frowned, the lines would appear properly.

When the lines were all in place, a light line of white was run along each one to indicate the ridge which is the natural complement of the furrow. Her lips were covered with ground color without rouge.

Up to this point the face still looked young. Now her cheeks were filled in with shadow to sink them. The make-up directly above the brows was cleaned off and a line of spirit gum run in over which was pasted a strand of gray crepe hair. Another section

of skin was gummed and another strand pressed down until heavy gray brows were established. These aged the face and cast a shadow over the eyes. The brows were trimmed down with scissors and finally the face was powdered, a little being permitted to get into the hair over the forehead.

No lipstick, mascara or accents of any kind were used. A low intensity light with plenty of shadow was used and we had a presentable picture of what Pat would look like fifty years from now.

Figures 1 to 4 show other permutations of Pat, less sensational perhaps, but more to the point. It goes without saying that your model, whoever she may be, must do her part in acting out the character of her make-up. This is far from difficult. When you have made her up to look the part and dressed her to suit, you will find that she can fall into the spirit of the occasion with surprising ease.

Make-up approaches perfection when no trace of it is evident in your finished picture, unless, of course, you are trying to do tricks.

The following books may be ordered postpaid from MINICAM, 22 East 12th St., Cincinnati, Ohio. The retail price is listed after each book.

Books for Photographers

Natural Color Film, What It Is and How to Use It\$1.50
By Clifford A. Nelson

A volume for the amateur who desires to achieve the full beauty available in Kodachrome in both motion picture and still photography. Illustrated with exposure tables and much valuable data.

Pictorial Photography with the Miniature Camera....50c
By George W. Hesse

A book on how to make home portraits with minimum effort and expense. Contains hints on composition, lighting, film make-up, etc.

Composition Simplified75c
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Let's Make a Portrait.....\$1.00
By Alfred De Lardi, F. R. P. S.

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Perfect Print Control.....\$2.50
By Lawrence Dutton

The only full length book devoted exclusively to projection printing problems. The author has worked out a system of classifying projection papers and grading them for characteristics. Profusely illustrated with pictures and diagrams, including full directions for the construction of a home-photometer.

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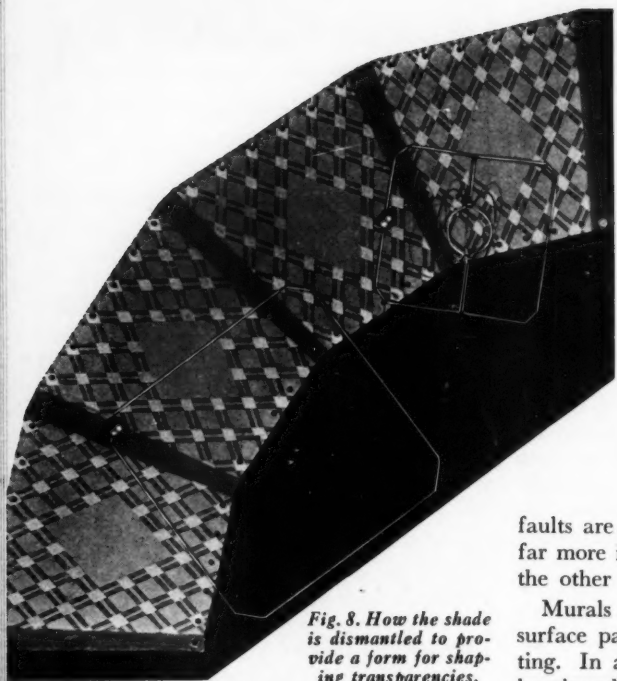


Fig. 8. How the shade is dismantled to provide a form for shaping transparencies.

(Continued from page 82)

the same time, since it will be almost impossible to keep one print from streaking another. Instead, develop each section separately to a strict time schedule of a minute and a half. Fresh developer, from the same batch, and at a constant temperature, should be used for each section.

After washing and drying in the usual manner, the next job is to join the various sections. You will recall that an overlapping edge of an inch was left on each section.

First, the edges to be overlapped are carefully "shaved" down on the underside to the extent of the overlap. The purpose of this is to thin them down so that there will be no telltale bulge at the connecting edges where the paper would normally be double thick. The "shaving" is accomplished by first laying the print on its face and moistening the edge slightly. Then, with your finger, roll away a thin layer of the backing paper.

The other connecting edge is now treated in the same way. Care must be taken that too much paper is not removed, but otherwise the task presents no difficulty. Do not

attempt to join the edges at this time, but wait until you are ready to mount the complete picture. If carefully done, this photographic surgery will not be noticed, especially at the distance usual for viewing murals.

Finishing and Mounting The Mural

After drying, the sheet is pressed with a moderately warm iron to take out the cockle and then it is retouched. You know how annoying dust spots can be in even comparatively small prints. In the larger size, it is practically impossible to avoid them. Because even microscopic

faults are brought out plainly, retouching is far more important than in small prints. On the other hand, it is considerably easier.

Murals are usually made on a fairly rough surface paper that responds readily to spotting. In addition, the final picture will not be viewed as closely as a small print so that slight imperfections in spotting are unimportant. Spotting pencils are used to fill in dust spots and an etching tool or sharp penknife to remove black spots. Use the etching knife carefully, picking up only a tiny flake of the emulsion at a time. Stand back frequently to inspect your work, since it will not ultimately be subjected to scrutiny a few inches from the paper surface, but rather at several feet. Use the etching knife sparingly or, if you are in doubt, not at all.

There are two steps in making a mural which are customary, though not familiar to workers in smaller size pictures. The print is waxed and polished. This gives it an attractive finish but, more important, protects the print from marks such as fingerprints, dust, etc. Larger murals are often likewise given a coat of matt drying waterproof varnish before waxing, so that they may be cleaned with a damp cloth from time to time.

If you live in your own home, the mural can be cemented directly onto the wall surface for which it is intended. An alternate and equally satisfactory method, if you feel you may later want to move the print, is to

construct a wood framework of stock about $\frac{1}{2}$ " thick and nail to it one or two cardboard sufficiently to cover it. The cardboards must, of course, exactly match the dimensions of the mural. Fix the completed frame in place on the wall with wire nails, countersinking the nailheads.

The enlargement is now attached to the framework with rubber cement. Do not use glue or paste. Allow the rubber cement to dry a bit before attaching the print. With sectional prints, attach the first section to the panel. Now put the rubber cement on the next section and match it up closely with the first, making sure the continuity is smooth at all points. Then cover the joined edges with a large blotter and roll into firm contact with a print roller. The advantage of using rubber cement is that if you missed perfect contact on your first attempt, the print can be removed from the cardboard without damage.

The principal point about making large murals is to learn so to interpret small test sheets that you will rarely have to repeat a large exposure. If you will do this, you will find that, apart from the physical effect of

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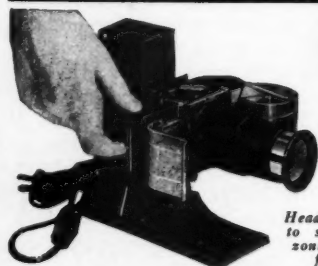
developing with the mop technique, the production of murals is not difficult.

Your most frequent errors are likely to be improper exposure and development. If the print is over-exposed and removed too soon from the developer, the tones are heavy and muddy. If the exposure is too short, the print will be weak and, if forced, it will become harsh.

A tank six feet long is not a contrivance that lends itself to easy storage. It is therefore advisable to decide at one time on the various murals you will want, larger than your regular trays will accommodate. All the mop-developed sheets can then be exposed and developed in a single session or over a week-end, and the tray dismantled. Such planning will also permit you to make a selection of subjects which will give the whole house unified decoration. Smaller side panels, friezes and other minor decorations can be decided on at the same time and completed later at your leisure.

The purpose of the mural is decoration. For that reason the print must be attractive in its technical quality as well as in subject

Fig. 9. An exhibition wall for photographs can be made out of monk's cloth and ordinary wood moulding.



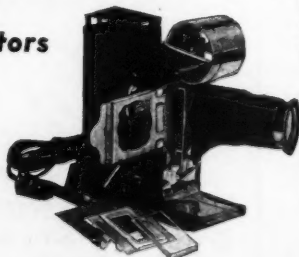
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matter. It should be exposed so that at the one and a half minute limit the development reaches the pausing point and holds there for several seconds. This means that if you have selected the proper paper and grade, your blowup will have all the quality of the original negative. Such prints should be dark rather than light, but not muddy or heavy.

In wall murals you are by no means limited to a single negative. You can use several or you can make a montage, if you have had experience with this type of subject. The basic procedure is the same. However, bear in mind that in large pictures, simplicity is very important. Frequently the montage defeats its own purpose and serves to create only a sense of confusion.

Repeated Pattern Murals

An interesting and easy variation on the photo mural is the repeated pattern mural, as in Fig. 3. Whereas the usual type of mural is a single picture or combination of pictures designed to fill a specified space, the repeated pattern mural is an over-all wall covering similar to wall paper. Instead of a conventional wall paper design, however, a photographic design is made in the following manner:

Let's assume that you want to paper a kitchenette in some appropriate fashion. Fig. 3 shows the design made by simply posing the selected objects and photographing them against some neutral background. The negative is then projected in exactly the same way as it would be for a mural, with the exception that its size is held to about 16 x 20.

Thereafter, a series of prints is made in sufficient number to fill the desired area. These prints should be on single weight paper. They are then affixed to the wall either with rubber cement, if the area to be covered is comparatively small, or with a small quantity of regular painter's glue which can be purchased at any supply store.

An interesting variation of the above is to make three or four pictures of the same subject from slightly different angles and then use them alternately in the design. It is suggested that before you make an actual pattern mural you experiment with small prints and work out the design that seems best suited to your needs.

Small rooms adapt themselves particularly well to repeated pattern designs, where they would not take a large single picture. A design of pipes and books for the den, music and notes for the music room, toy figures for the nursery, sport patterns for the game room — any number of ideas will suggest themselves as soon as you give the matter a little thought.

While exposing the prints for the repeated pattern design is no problem, you will have to exercise some care in developing. The best procedure is to use a large tray and develop two at a time, back to back. The exposure should be so stand-

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See Page 79

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ardized that development is completed in a minute and a half. Since general evenness of tone is of paramount importance, it will be worth your while to use fresh developer for each set of two prints. This may seem like waste, and it is, but not nearly so great as if you ruined half or more of your prints through variations in tone.

If you mix your own developer, make up a gallon or more of stock solution. Keep it in the icebox or in some cool place where it will not be subject to variation of temperature. Don't remove it except for the few moments at a time necessary to refill the developer tray. As you know, the action of developers varies considerably at different temperatures, so care must be exercised to keep temperature constant throughout the developing period. With these two precautions of uniform exposure and developing time, plus fresh developer at a constant temperature for each set of two prints, you should not experience the slightest difficulty with tonal variations.

One piece of advice. Keep the design of your patterns simple. Consider your picture not in terms of a single print, but of dozens or scores. What may seem like a fairly empty shot viewed by itself, will fairly teem with activity when it recurs around a room. So err on the side of simplicity and test with half a dozen or so 4 x 5 prints side by side before you start to expose the big paper.

Photo Screens

A fairly recent addition to the photo mural family is the photo screen. This consists, generally, of a three-panel ordinary wood or frame screen on which has been mounted one or more photo murals. The technique for the execution of such screens differs only slightly from the usual murals.

First, of course, you need the screen. This may be purchased as an unfinished wood screen at reasonable cost, or it may be of the framework type covered with canvas or bristleboard. Either way, the final effect will be the same.

Now the design for the mural should be selected, bearing in mind that the negative must be considerably longer than it is broad. For this type of work you will frequently find that portions of a negative, rather than the whole picture, are suitable. The only other considerations is the appropriateness of the design, and this will be determined by the use to which the screen will be put.

Since the photo screen will be subjected to somewhat closer scrutiny than the wall mural it is advisable, when possible, to make each panel out of a single sheet. Failing this, the job of joining must be done with much greater care than is necessary with wall pictures. Or you can make a virtue out of necessity by deliberately choosing a repeated pattern, in which case concealment of the joined points is unimportant so long as they are not actually unsightly.

Making photo screens for sale, incidentally, can be a very profitable source of income. While many people will hesitate to purchase anything so un-

accustomed as a wall mural, few homes have corners that would not be brightened by the addition of a gay screen or two.

Transparencies

The transparency is processed in practically the same way as ordinary prints or enlargements. The chief difference is that the transparency is viewed by transmitted light rather than reflected light by which pictures as well as other objects are ordinarily seen. In making a test strip, the correct printing time should be determined by looking at the strip with the white light behind it so that the right density is achieved for revealing full detail.

One of the most interesting domestic uses for the transparency is the home-made lampshade, Fig. 1. The procedure is simple but requires some time. The easiest way to make a lampshade from photographic transparencies, is to use as a base a discarded lampshade which has outlived its welcome in the house, or else purchase an inexpensive one. Remove the paper shade from the wire frame and lay it down on a large sheet of white paper, or several sheets of paper pasted together to accommodate the area of the shade as in Fig. 8. Tack the latter down so that it does not budge while you draw an outline of the shade on the white paper. Be careful to cut off the overlapping edge of the shade before tacking it to the paper, otherwise your measurements will be off by that extra length.

Decide how many pictures you wish to include on your shade, the number, of course, depending on the size of the shade and the nature of the pictures to be used. Divide the outline you have drawn into the number of pictures you wish to use. This is best done by cutting out the outline and then folding it into parts, each portion con-

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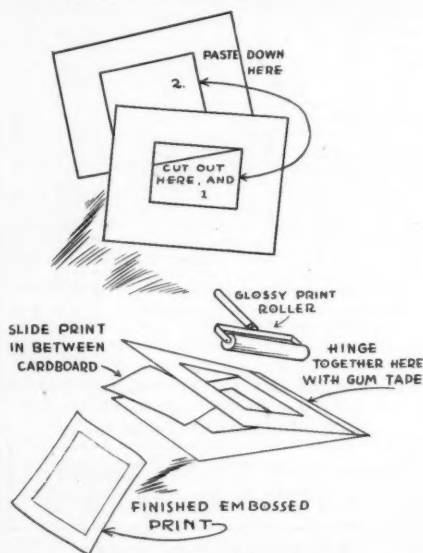
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Fig. 10. Basic design for picture-under-glass, home-made end table or tray. The plate glass is 1/4" thick. Note the hole bored in the wood so that the glass can be readily lifted.



(Continued from Page 33)

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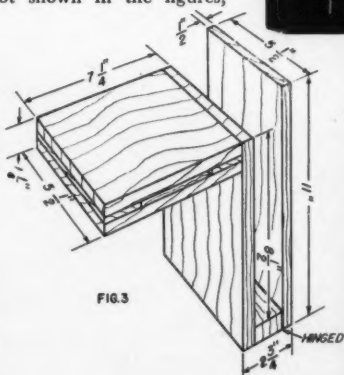
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All dimensions necessary, as well as the method of construction, can be easily seen in Fig. 3.

The tripod sockets, not shown in the figures, are taken from an old camera. They are centered on the correct boards, countersunk, and held in place by small screws. The tripod screw, which holds the camera, is threaded through a hole in a small metal plate, which may be drilled with either a $\frac{1}{8}$ " or a number 14 drill, and threaded with a $\frac{1}{4}$ x 20 tap.



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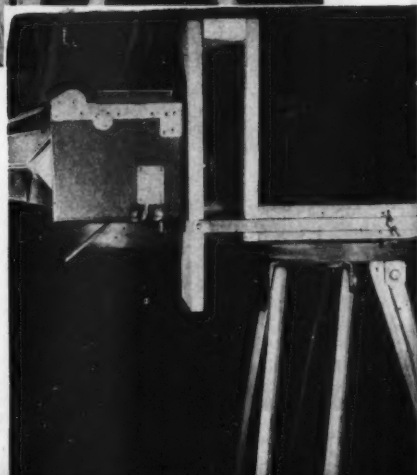
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From a sheet of cardboard one-sixteenth of an inch thick there is cut a rectangle the exact size and shape of the desired embossing. It is necessary that a sharp knife or razor blade be used, to give clean lines.

The rectangle cut out is pasted on another sheet of cardboard, and the border piece from which the rectangle was cut is placed over it. These two pieces are now hinged with scotch tape or a similar tape, and the edges trimmed to present a neat appearance.

Embossing is done by placing the print between the cardboards and pressing on them with the rubber roller. The position of the print in the embosser is determined by trial, after which pencil lines are made to facilitate placing the prints in the correct position.

The embossers are so easy to make that you can have a separate one for each size print.



stituting the size and shape of the individual picture to be put on it.

The prints will be made on one of the regular size transparency films and the latter afterward trimmed to fit the outline. The finished transparencies, trimmed as outlined, are then joined to each other and to the upper and lower rings of the lampshade frame either by means of binding tape or by binding the individual transparencies and then joining them to each other and to the shade framework with heavy cotton thread. See Figs. 6 and 7. The bulb used in lamps having transparency shades should be sufficiently strong to show off the detail in the pictures.

Such color materials as Kodachrome and Dufaycolor fit beautifully into home decoration. While the Kodachrome transparency may be considered too small for direct viewing without benefit of a projector, one interesting method of employing it is to select about ten such transparencies and arrange them, checkerboard fashion, within a frame to be fitted into a window pane. The blank spaces between the pictures would be left open. Such a layout would, of course, call for a group of transparencies on related subjects. If used in a child's playroom, for example, each transparency might be a photograph of a toy or an animal or of things in the home related to the child's routine.

The larger Dufaycolor transparencies could be used in this way to make a decorative strip down each side or a large windowpane. Cut two long strips of glass for each panel and lay the transparencies one below the other, binding all around the edges as if making a lantern slide. A strip

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of passe-partout of the appropriate color and width may, if desired, serve to separate the pictures from each other. The whole can then be enclosed in a thin wood frame which may be attached to the window frame in such a way as to permit its removal from that position at will.

There is another variety of lampshade transparency which does not involve quite so much work. Print your pictures on translucent, double-coated paper and attach them to the inside of a clear lampshade by means of a thin coat of the best white shellac. If you want a bolder effect, they may be attached to the outside of the shade.

If the picture is quite light and is attached with the lighter side out, the scene will be visible whether the lamp is lighted or not. A variation of this is to tint the under side of the paper transparency so that with the lamp lighted, the picture will appear in color whereas normally it would be a black and white. It might be added that, for such purposes, the hand-tinted picture is usually preferable to the natural color one.

Pictorial Serving Trays and End Tables

The requirement for a pictorial tray or end table is a surface with a removable glass bed, Fig. 10. Most table tops can be supplied with glass at nominal cost. As for serving trays, if you cannot purchase one to suit your specifications, you can easily make it yourself or have a cabinet maker construct one after your design.

The tray should be of wood with a low "wall" around it into which to set the glass. In one corner of the tray, bore a hole 1/2 inch or so in diameter. Make an enlargement to fit the inside dimensions of the walled tray. Place the picture in the tray, cover it with the glass, and the job is done. When you wish to change the picture to suit the season or occasion, simply raise the glass and picture by poking a pencil through the hole at the bottom.

A Home Show Wall

Many people raise the objection that they would not care to live indefinitely with one picture or that the mural, while excellent, would not fit in with their type of decoration. For them and for camera fans who like to exhibit their prize pictures in rotation, a home-made "show wall" is ideal, as shown in Fig. 9.

Select a wall where there is good light and where lamps do not throw a glare at night. Purchase a length of monk's (or friar's) cloth, which comes fifty inches wide, sufficient to cover the area in question. You may, of course, have your "salon" any width or length you desire or your facilities can accommodate.

Now buy some molding of plain design and have it cut and mitred to fit the two long sides and the two short sides of the salon. Tack the cloth onto the wall, driving the tacks as close to the edge of the cloth as possible, pulling the cloth taut, this way and that, until it is attached to the wall without wrinkles. Be sure that the characteristic ribbed pattern of the cloth runs vertically and horizontally, not askew.

When this has been finished to your satisfaction, you are ready to cover up the unsightly edges

with molding. The molding should be sanded down and then treated to a coat of linseed oil. After it has dried, tack it in places around the four sides of the exhibition space so that the edges of the monk's cloth are covered.

The linseed oil treatment will eventually cause the molding to turn a golden brown which will give it a more pleasing appearance than paint. Your display wall is now ready. Pictures should be mounted, preferably on 16 x 20 mounts. Drive in picture hooks at appropriate distances and hang your pictures.

If you are further ambitious, you can considerably "dress up" the display wall by attaching to it, right through the monk's cloth, two parallel strips of aluminum or other silvered molding, twenty inches apart. Pictures are slipped between the two edges which then act as a frame. Or you can make the strips closer together and insert pictures without mounting. This makes an unusually handsome temporary or even permanent exhibit. If now the picture is strong enough to support a glass over exhibitors, you are up in the class of professional molding.

Once you have tried your hand at a photo mural or other type of decoration, ideas will come to you by the score. The application of photography to decorative work offers unlimited possibilities, the better because nothing in the way of special equipment is required. Any minicam equipped with an average good lens can be used for making the negatives. Reasonable care in development will yield negative quality sufficient to stand up under the enlargement required. After that, your expense is only for paper and the nominal chemical cost for developing and fixing.

Your choice of subject matter naturally depends on your individual taste. There are few rules here. One, however, that may spare you future annoyance is this: Consider your picture for the mural as one you are going to have to look at pretty often. Ask yourself whether it is a picture which possesses a permanent charm or whether its appeal lies in a startling quality that is lost with familiarity. If you get the right answer, you are safe to go ahead.

Don't be frightened by mysterious discussions about composition. If you like it and can bear to live with it, that's test enough. Don't jump in head first unless you happen to be that sort of person. Make small ones first and work up to the larger sizes. You will find your home more attractive and in the making, you will have expended many happy hours.

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\$ With Your Minicam

By John P. Lyons

THE business of selling photography is 80% knowing the market, 20% having a picture which will reproduce well. Too often the camerist's acquaintance with periodicals is limited to some twenty different magazines. Yet there are more than 5,000 magazines, and house organs published in this country. And they all want suitable pictures. Check over the markets in this report, every one of which was received within the past thirty days. Match a requirement with a picture now in your files, make a 4x5 or an 8x10 print, write your name and address and a short caption telling what the picture is about, and send it off. Be sure to enclose an envelope, stamped and addressed for its return if the editor should not find it acceptable. The only way to sell them is to show them.

American Optical Co., Southbridge, Mass., for their house magazine "American Optical Vision," want odd and unusual pictures of spectacles and spectacles worn by famous people.

Gordon Howard, Editor of "The Watch Word", house organ of the Elgin National Watch Co., Elgin, Ill., calls for "photographs showing interesting, odd, unusual and different uses of modern or ancient timepieces, particularly Elgins. Candid shots of celebrities using their Elgins."

Columbian Rope Co., Auburn, N. Y., call for photographs with short descriptions of interesting, odd, and unusual uses of rope and twine, especially their own make. Good prices can be expected in these three markets.

Caterpillar Tractor Co., Peoria, Ill., buy photos and movie film of their current Diesel tractors, road machinery and power units in various installations, as well as occasional photos of their gasoline-powered tractors. Prefer 8x10 negatives, \$5 each, and 50c per foot for acceptable 35 mm. negatives. Before submitting pictures, communicate with P. C. Smith, Advertising Dept.

Louis Allis Co., Milwaukee, Wisc., manufacturers of electrical motors, etc., publish a house organ, editor, Israel Brace, Sales Dept., \$2 to \$10 for photos of outdoor scenes, human interest, seasonal illustrations, holidays and special occasions of all types.

Aetna Life Insurance Co., 151 Farmington Ave., Hartford, Conn., for "Life Aetna-izer", Editor, Eugene M. Reed. \$5 for 8x10 glossy prints of human interest photos that suggest the need of security of life insurance. The Provident Life and Accident Insurance Co., Chattanooga, Tenn., for "Provident Lookout", Editor, Bart Leiper. \$5 for photos that present situations suggesting the need and uses of insurance, both life and accident.

TWO large manufacturers in the photographic field restate their needs this month; but in this market, only the highest type of picture can hope to win. Folmer Graflex Corp., Dept. 303, Rochester, N. Y., H. A. Schumacher, Director of Sales. Glossy contact prints of any size (not enlargements) Graflexed by users of their cameras. They have a great deal of use for such pictures in their advertising and wish to add to their files against

occasions, often arising, when such pictures would meet an immediate, specific need. Agfa Ansco Corp., Binghamton, N. Y., maintain a similar file, pictures here being judged on three points: 1. photographic quality, 2. subject matter interest, 3. composition. Pictures must be produced on Agfa film. Acceptable negatives, \$5 each. Address Robert M. Dunn, Advertising Dept.

Dispatch Photo News Service, Inc., 207 West 25th St., N. Y. C., is a photo service that is seen in windows of retail dealers, insurance companies, wholesale merchants and industrial plants to attract attention to windows and bulletin boards. They buy a variety of spot news shots, feature pictures and views of disastrous fires and automobile accidents. \$3 and up.

Thomas D. Murphy Co., Red Oak, Iowa, are manufacturers of calendars. Malcolm D. Lomas, Vice-President, invites camerists to correspond with him, if they think they have a picture suitable for calendar reproduction.

Amerique, 137 West 27th St., N. Y. C., printed in French and distributed among Frenchmen. Wants photos, especially good candid shots of "out-standing political personalities, literary men, etc."

Did you vacation in the Orient this year? If so, *Asia*, 40 East 49th St., N. Y. C. will pay \$3 each for your good views, "especially the unusual". This magazine covers all Asiatic countries, Russia and Pacific Islands. Paul's Photos, 537 So. Dearborn St., Chicago, Ill., a syndicate, pays \$1 up for "strange sights of foreign lands, also customs, etc."

Associated Photofeature Syndicate, 48 Charles St., Boston, Mass., R. F. Elie, Jr., Feature Editor. Pays from \$3 to \$10 for exceptional pictures of

odd or unusual persons, places and events. Captioned photographs on every conceivable subject, human interest, technical, artistic, novel, dramatic, pictorial or historical. Prints 5x7 or larger are preferred.

Better Times, 44 East 23rd St., N. Y. C., a review of Social Work activities published by the Welfare Council of New York City. Grace Branche, Business Mgr., offers \$5 for short-captioned shots of settlement and neighborhood houses, community centers, day nurseries, recreational and health camps, which tell a story.

Cinema Arts, 250 Park Ave., N. Y. C., the deluxe movie magazine. Offers \$5 to \$10 for candid camera pictures of Hollywood people and news photos with movie angle. 8x10 glossies preferred. Must be of high photographic quality.

Coronet, 919 N. Michigan Ave., Chicago, Ill. Have a mimeographed set of instructions available for the asking, giving details of photos wanted. The editor is willing to experiment with reproduction, so you may submit your own ideas for this or for some particular finish you would like to see tried. A study of the magazine will indicate the sort of subject apt to click.

Current Ideas, 540 N. Michigan Ave., Chicago, Ill. A revived magazine on popular mechanics and science and call for this type of picture in engineering, aviation and automatic machinery fields.

Foto, 149 Madison Ave., N. Y. C. A 10c "all-picture" monthly, edited by John M. Richmond. \$5 to \$10 for photos "sometimes weird, tragic, horrible, funny, crazy single shots." Spot news photos of crime, animals, oddities, scenic and

(Page 102, please)

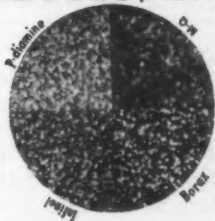


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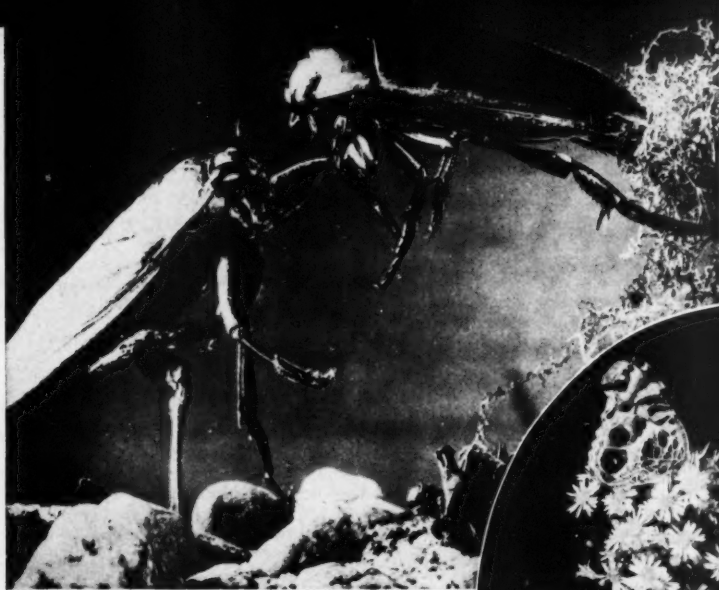
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Above: No more deadly enemies exist than these two warring varieties of beetle. Their strength, in proportion to their size, makes them invincible fighters.

for this advice is not only to procure correct exposure but also to insure that you are working at an aperture small enough to give satisfactory depth of focus, yet not so small as to produce flare spots.



MINICAM

Below: A dainty way to eat. A painted lady butterfly, left, and a monarch butterfly share a meal of asters.

Table based upon use of two inch lens at greater than normal extension

Additional Extension	$\frac{1}{2}$ "	1"	$1\frac{1}{2}$ "	2"	3"	4"
True <i>f</i> value when set at <i>f</i> 11.....	13.8	16.5	19.4	22	33	44
Relative Exposure	+50%	+1.65%	+210%	+300%	+800%	+1500%

Note: Additional Exposure is added to the meter indication

In any event, securing reasonable depth of focus will not be easy. As you know, a photographic lens can be focused sharply on only one thing at a time. Everything before or behind this object will be more or less out of focus depending on its distance from the object focused upon. However, the nearer the principal object is to the camera lens, the less amount of reasonably good focus there is on either side of it. Under normal circumstances, a good lens focused on an object fifteen or twenty feet away will give you a depth of several feet of reasonably sharp focus or, to put it into camera lingo, "depth of focus."

IN this close-up work, however, your lens is only inches rather than feet from the object, which means that the depth of

focus is reduced from a matter of feet to as little as a fraction of an inch. Naturally, you must know what the depth of focus is going to be, otherwise your pictures will be fuzzy. I have, therefore, included a second, and final table showing the depth of focus obtainable at varying working distances. The *f* markings in the table refer to the revised numbers as obtained in the previous table. The size of scale, of course, refers to the distance the lens is from the object which, in turn, determines the size of the reproduction on the film.

Scale of size	<i>f</i> 5.6	<i>f</i> 8	<i>f</i> 11	<i>f</i> 22
1 to 1	0.043"	0.063"	0.087"	0.174"
1 to $1\frac{1}{2}$	0.083	0.118	0.165	0.33
1 to 2	0.13	0.19	0.26	0.52
1 to 3	0.26	0.38	0.51	1.02
1 to 4	0.43	0.63	0.87	1.74

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VOL. 27 No. 2

179 WEST MADISON STREET, CHICAGO, ILL.

OCTOBER, 1937

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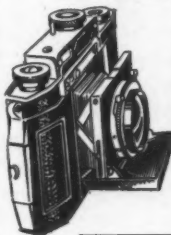


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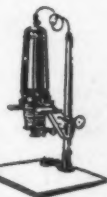
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Film adapter and 3
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9x12 cm. size . . . **\$53.00**
Carrying case . . . **\$4.50**

To find out whether all of an insect will show in sharp focus in any particular picture, measure its length, *in line with the camera*, not broadside to it. If it is too long, try placing it sideways in which case its width is in line with the camera.

As so frequently is the case, all of the above sounds more formidable in the explaining than it really is in working practice. Actually, you will seldom need to do more than refer to the table of working apertures to determine correct exposure, glance at the second table to find your depth of focus, and shoot. It will take only a few trials to learn whether you have hit exposure right or are consistently over or under exposing and to make your adjustments accordingly.

Once you have mastered the simple technique of the reproduction accessories, you can branch out. Butterflies, moths, bees and a million other insects offer infinite possibilities in building up a rogue's gallery of miniature monsters. I can guarantee you results which, if not so solid as a stuffed elk's head will be considerably more original and comment provoking.

\$ With Your Minicam

(Continued from page 99)

human interest. Series of four to ten photos revealing a story on crime, in sequence, or on science, hobbies or oddities. 8x10 glossies are preferred.

Little Chronicle, Drawer 230, Oak Park, Ill., pay \$1 to \$3 for action photos which are self-explanatory. Human interest to appeal to a general reader audience.

Panorama Magazine, Bryant Bldg., Kansas City, Mo. A pictorial monthly covering Kansas City, Dallas, Omaha, Oklahoma City and adjacent territory. Photos of this area, feature photos on the order of those used in *Life*, in science, travel or anything unusual, candid shots of celebrities, unusual scenes, etc. Nothing smaller than 4x5. \$2 to \$5.

Pic, 79 Seventh Ave., N. Y. C. Another all-picture monthly. Wants shots of sports, action, oddities, Hollywood stars, their hobbies and sports, Broadway personalities and night spots. Some news shots of sports. \$5.

Volta Review, 1537 35th St., N. W., Washington, D. C. Directed to teachers of the deaf, parents of deaf children, hard-of-hearing adults and teachers of lip reading to the hard-of-hearing. A hard market to supply. \$1 to \$3.

Up in Dublin, N. H., there is published "Yankee", devoted to the interests of New England culture and organizations. Editor wants cover pictures of New England sports such as skiing, etc. News photos of New England and Yankees living outside New England. \$2 to \$5.

The Wild Flower Preservation Society, Inc., 3740 Oliver St., Washington, D. C., has about every known wild flower already in its files. But it is always glad to purchase pictures of additional subjects. *Nature Notes* is a new magazine published at 4800 Prospect Road, Peoria, Ill. Want shots of nature and science subjects. 50c to \$1, but maybe they will raise the rate if they prosper. Flower Garden, 2049 Grand Central Terminal, N. Y. C. wants photos of gardening and flower growing, with a short recital of personal experiences.

Dog World, 3323 Michigan Ave., Chicago, Ill., is published for those who breed, raise and exhibit pedigreed dogs, and covers every breed. Profusely illustrated with staff-made picture but always glad to consider anything unusual. *Bird-Lore*, 1775 Broadway, N. Y. C., is the organ of the National Association of Audubon Societies. William Vogt, Editor, pays \$2 for unusually good single shots of birds and mammals. *Arizona Wild Life*, P. O. Box 2461, Tucson, Ariz., wants photos on the conservation and restoration of wild life. No payment, but credit line given.

Organizations and societies always like views of the activities of their respective orders. Here are a few. *Sovereign Visitor*, 719 Insurance Bldg., Omaha, Nebr., organ of the Woodmen of the World, pays \$2 each for views of lodge social activities, participation in civic affairs, marching groups and parade floats, charity work and events in which their national officers participate. *The Modern Woodmen*, 318 16th St., Rock Island, Ill., do not want lodge activities. Edward E. Wilson, Editor, states he wants photos which will serve for reproduction on the cover of the magazine but the picture must refer to some particular event which falls within the month the magazine is published. *The Rotarian*, 35 East Wacker Drive, Chicago, Ill. Organ of Rotary International. Buy "action photos of Rotary Club interest." *Lion*, 350 McCormick Bldg., Chicago, Ill., is the organ of the Lions Club. Members submit much of the photography used, but outsiders' material is considered. *Foreign Service*, 404 West 34th St., Kansas City, Mo., published by the Veterans of Foreign Wars. \$3 for photos of activities, marching bodies, charitable work, etc., pertaining to the association.

French Stamats Co., Cedar Rapids, Iowa, publish a number of magazines which are syndicated to various business establishments interested in home betterment. Herbert Stamats says he will pay \$2 to \$15 for exceptional photographs of "outstanding home interiors, exteriors, interior decorations, furnishings, and gadgets." M. R. Kaufman, Art Editor of *McCall's Magazines*, states they pay \$5 to \$50 each for photos they use. The type wanted is best determined by reading the magazine.



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MOST AMAZING PICTURE BOOK THEY EVER SAW!

WHO IS WILL CONNELL?

Will Connell has for years been a star in the crown and a thorn in the side of Hollywood's movie factories. His camera is responsible probably for more pictorial excellence, his satire has exploded more publicity balloons, than any other two forces in Los Angeles County. What Winchell puts on paper, Connell has put on film—to the glorification and mortification of Hollywood's leading citizens. Good photographers rate Will Connell one of America's few fine photographers.

WHAT ARE THE PICTURES "IN PICTURES"?

Until recently, "IN PICTURES" was a private photographic history of Hollywood compiled by Connell for his friends' amusement and his own. "IN PICTURES" is the inside story

of making pictures—a collection of remarkable photographs revealing the beauty, the characters, the tools, the politics, and the genius of movie making. It is Americana; it has been called surer, swifter satire than "Once in a Lifetime" and "Boy Meets Girl." The originals are the photographic exhibit in the American section of the Paris International Exhibit.

WHAT ELSE IS IN "IN PICTURES"?

"Hollywood Conference," the story that accompanies the pictures, appeared originally in the Saturday Evening Post. It is an actual stenographic report of a screen story conference and as cockeyed a scenario as you'd expect from the four gentlemen who participated in its birth. Namely, Gene Fowler, Nunnally Johnson, Grover Jones, and Patterson McNutt.

WHAT DOES "IN PICTURES" LOOK LIKE?

The book is also a marvel of photo technique—montages, still lifes, action shots, and character studies are in it in plenty. It runs the full range of picture-taking art from the simplest to the most intricate in camera work. It was edited by T. J. Maloney, editor of "U. S. Camera." "IN PICTURES" is extra size, is printed in Beck Gravure, the same proc-



ess used in "U. S. CAMERA" reproductions. All illustrations are full page 10" x 12" and every other page is a picture page! The pages opposite the pictures are devoted to "Hollywood Conference."

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The price of "IN PICTURES" is \$2.50—no more than that of an ordinary novel. Just clip the coupon below to get your copy by return mail.

Remember, it isn't necessary to send any money now. You may pay for "IN PICTURES" when your

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COMMENTS ON "IN PICTURES"

- FRANK S. NUGENT, motion picture critic of the New York Times says: "It's really a grand job of satirical photography, a perfect illustration of its incredible text. It has a preferred position on my bookshelf."
- EDWARD STEICHEN, Anton Bruehl, William Rittase, Paul Outerbridge, Lejaren Hiller, are a few of the nationally famous photographers who've recommended "In Pictures."
- RAYMOND LOEWY, famed industrial designer says: "It's the funniest thing I've seen in a long time and I'm taking it to France to give them an idea of real American sense of humor."

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